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March 12, 1990

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MaryAnn Croce LaFaire
United States Environmental
Protection Agency
5PA-14
230 South Dearborn
Chicago, IL 60604

Re: NL/Taracorp Superfund Site

Dear Ms. LaFaire:

We represent Johnson Controls, Inc. with respect to issues concerning the NL Industries/Taracorp secondary lead smelter in Granite City, Illinois and offer the following public comments on behalf of Johnson Controls. We understand that the comment period in preparation for the Record of Decision closes today, having been extended from February 24, 1990. Johnson Controls is disturbed by the agency's failure to forward to many parties identified as PRPs in a letter dated November 28, 1989 (including Johnson Controls) information about the specific dates for comment and public meetings, as well as information discussed below concerning the site. We request that all future information concerning the site which United States Environmental Protection Agency ("U.S. EPA") disseminates for public attention be directed to me at the above address.

At the December 19, 1990 meeting conducted by the agency, U.S. EPA stated that its "hybrid" alternative remedy was projected to cost less than $14 million. Under such a scenario Johnson Control's reasons for investing considerable efforts into commenting were somewhat attenuated, given that the remedy's price seemed in line with projections for other lead smelter sites and the company was one of many who had been contacted by the agency regarding potential liability for cleanup. However, by chance we were recently sent by another PRP the agency's fact sheet for the site, which indicates that the cost for the remedy has ballooned to $25 million. According to information presented to us by NL Industries on March 9, 1990, it appears that the agency's low early projection resulted from an arithmetical error. Also, NL Industries has challenged some of the

assumptions that the agency used to calculate the cost of its remedy. It appears that the agency's preferred remedy cannot be implemented within the currently defined property. Accordingly, as much as another $20 million may be necessary to complete the preferred remedy if additional property or off-site disposal becomes necessary. The fact that we learned of these facts long after the agency opened the comment period is unfair. We request that the comment period be further extended so that we have adequate time to analyze the revised proposal. We note that if the misinformation disseminated at the December 18 meeting had been corrected by communication of the fact sheet to us, the problem would not have arisen. Without an adequate flow of information reasonably calculated to reach affected parties, due process is lacking.

From our attenuated review of the administrative record gathered to date, the mechanism by which U.S. EPA arrived at a 500 ppm cleanup level for lead is not apparent. The guidance document upon which the agency relied is first of all just that, a guidance document. As noted in the McLouth Steel decision regarding U.S. EPA's implementation of RCRA guidance documents, such documents must be used with a healthy dose of agency discretion.[1] If they have not been subjected to the rigid scrutiny required of a rule under the Administrative Procedure Act, they should serve only as a guide by which the agency performs a case-by-case analysis to reach a reasoned and justifiable decision, rather than a guise for arbitrary and capricious decision making. The administrative record for the NL/Taracorp site is currently devoid of documentation demonstrating the step-by-step decision making required by the federal Administrative Procedure Act. While the guidance document at issue states that the range of lead in soil which will not pose a threat to human health and the environment lies between 500 and 1,000 ppm, it further requires the agency to examine site specific factors when reaching a decision about the appropriate level of lead in the soil.

We do not dispute the proposition that a 500 ppm standard will protect human health and the environment. We do question, however, whether such a low standard is necessary. It does not appear that U.S. EPA has given serious consideration to whether the proposed solution may actually do more harm, despite its added cost, than other alternatives considered in the site

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[1] We understand that the lead in soil guidance document is currently subject to challenge for reasons similar to McLouth's challenge of the agency's VHS guidance.

Feasibility Study. Risk assessments should take into account the harm which may occur as a result of the remedial activities. For instance, the risk that a child or adult may be bulldozed by heavy equipment running between residential neighborhoods and the site is not negligible. If the agency demands a cleanup which increases the chances of accident without discernible advantage on the environmental side, it has failed to protect human health and the environment. If the agency refuses to take into account the fact that disruption of the community may affect the economic well-being of the neighbors to the site, it further fails to quantify a real impact in the face of evidence that its cleanup will not be more protective of human health and the environment than that recommended by others. If U.S. EPA fails to understand what effect the needless spending of $40 million will have on the economy and the resultant unavailability of resources for other socially useful purposes, it again fails to protect human health and the environment. To give the extreme example, $40 million would feed a lot of starving people and prevent untold numbers of deaths. If the $40 million is spent to assure a better environment, we do not argue that a rational choice has been made. But if $40 million is spent without assurance that it was necessary, the impact on human life and the environment from the lost funds far outstrips whatever hypothetical loss the agency posits as reason to enforce a 500 ppm standard without a scientific basis to support the decision.

We understand the agency has rejected a portion of NL Industries' risk assessment because U.S. EPA does not agree with the choice of a reference dose. We also understand that the agency cannot supply one. This lack of resolution on the part of the agency should not be used as a reason for discrediting the study unless the agency has something better to offer in return. It apparently does not. We also understand the agency has rejected another portion of the study because it examined the lead blood levels of residents based on health department records. While we understand why the agency may not consider such evidence wholly indicative of lead exposure in the area, we fail to see why the agency rejects it as a factor in determining risk, particularly when the agency has nothing to substitute. Such arbitrary rejection of valid data smacks of arbitrary and capricious decision making, particularly where no evidence to the contrary is cited.

It is apparent from the record that the agency needs additional time to do its homework. Johnson Controls requests that the agency take the time to perform a reasoned risk assessment and rely on the result, rather than channel millions of unnecessary dollars into a cleanup simply because the agency has set internal deadlines it now claims must drive its actions.

As currently constituted, the administrative record is indefensible. The choice of U.S. EPA's preferred remedy would constitute an arbitrary and capricious exercise of agency authority.

Yours very truly,

Dennis P. Reis

cc: Thomas J. Courtney

DOWNTOWN NEIGHBORHOOD
RESTORATION SOCIETY OF GRANITE CITY
P.O. BOX 1517
GRANITE CITY, ILLINOIS 62040

February 27, 1990

Mary Ann Croce LaFaire
U.S. EPA Committee Relations Coordinator
United States EPA (5PA-14)
230 South Dearborn St.
Chicago, IL 60604

Re: DNRS of Granite City, Public Comment
U.S. EPA Proposed Cleanup, NL/Taracorp Site

Dear Ms. LaFaire:

Enclosed herein please find the materials representing the public comment of the Downtown Neighborhood Restoration Society of Granite City regarding the proposed cleanup of the NL/Taracorp site.

I have enclosed the following documents representing our group's position in this regard:

1. Fifty one pages of transcript representing the record of the meeting conducted on February 9, 1990, wherein Brad Bradley of the United States EPA explained the proposed cleanup proposition to the members of our group. As you can see from reviewing the transcript, there are a number of questions that were asked, and the positions of our group are outlined therein.

2. Signed and notarized Petitions circulated by our group and signed by members of the community of Granite City. As you can see, they are in opposition to United States EPA alternative "H" and in favor of the alternative "D" as the preferred solution. They are specifically requesting valid scientific studies be conducted with regard to the blood level of the children in the affected area.

Please consider this to be the public comment of the Downtown Neighborhood Restoration Society, the only organized group of homeowners in the affected area with regard to the proposed cleanup of the NL/Taracorp site. I would ask that you make this a matter of record and that it be utilized with regard to the final decision for the site. Please forward the response of the United States EPA to the undersigned listed herein.

Very truly yours,

John J. Hopkins
Downtown Neighborhood
Restoration Society
1412 20th Street; P.O. Box 731
Granite City, Illinois 62040
(618) 452-1092

This begins with Brad Bradley discussing about what proposals were planned as far as the movement of the Taracorp site and the solution proposed by EPA.

Brad Bradley:

. . . . .take the smaller piles into that Taracorp pile. Also, some things that aren't on the map, there are some alleys in Venice and a ditch in Eagle Park Acres where in the past they borrowed the black hard rubber chips for fill and that will be excavated and brought into the pile and then the largest portion of the remedy, the part that you would probably be concerned with is the shaded areas would be excavated and there's one more that's not on here. The shaded areas would be excavated to a 500 part per million lead clean up standard. We don't know exactly how deep that will go in the yards, but because the lead came from the smelter stack at Taracorp which was formerly National Lead, it was deposited on the surface of the soil and we don't anticipate that it would go much deeper than about 6 inches. There may be a few places where it would go a little deeper, but we feel that the average depth of excavation in these areas would be about 6 inches and what would be done, all of that material would again be brought to the pile and then the entire pile would be capped with what we call a multi layer cap a multi media cap which consists of about 3 feet of materials including gravel, synthetic liner and also some soil and vegetation on the top. What would be left would be a much larger pile, I don't know that it would be built any higher, that's really a specific aspect of design that we'll determine later, but it would certainly increase in area and occupy part of the property that trust

forfeit before St. Louis Lead Recycling was on or the Tri City Trucking area. Whichever would be more convenient basically. I understand Tri City Trucking is still doing business, so they might have an objection to that. What would be left would be a larger pile and it would be vegetated probably with grass. Something basically to keep it from eroding and washing away. That cap would also be maintained if there was any erosion or some cracks or some other activity that would disrupt that cap, it would be maintained. Basically U.S.E.P.A. and Illinois E.P.A. will attempt to enter into an agreement for the potentially responsible parties which include Taracorp, National Lead, St. Louis Lead Recyclers, Tri City Trucking and all of the generators that had waste, batteries or sodder, etc. sent to Taracorp to be smelted and resulted in that pile. We will attempt to negotiate with them and have them take over the clean up and we would provide oversight for that. I guess the only other detail that I would like to mention, we have had some examples in the past of where a similar situation has occurred. We have actually gone in and excavated yards. As is the case with any Superfund Site, there is nothing identical to this. Nothing where we did this large of an area to exactly or roughly 6 inches. But we do have the LaSalle Electric Utility Site in La Salle, Illinois for example. What they did there was they basically took care of 24 households and much largers yards, but they dug those yards to a depth of 3 feet. Its a smaller area, but a much for extensive excavation. They actually took out trees and basically everything except structures like concrete driveways and the house itself. They also went into the house itself and cleaned them out. Basically steam cleaned them and took all the surfaces and wiped up the dust. We're not going into anyone's

house and we are also not going to remove any trees. All that would be done is about 6 inches would be removed from the surface where there is exposed soil or possibly where there is a dirt driveway or gravel driveway, that would also be removed and that would be hauled off to the Taracorp site. One concern that would be obvious from doing that is it could generate dust and that's quite a large area to be excavating into and what we plan on doing there is wetting the material, if its not already wet from percipitation, we plan on wetting the material so that it won't create dust and if you-its a fairly easy thing to do with soil. You can wet it to a point where you really don't make a mud out of it, you can still dig it up, but you don't create dust. Especially when you are only digging about 6 inches deep.

The equipment that would be used would be just hand shovels or-and/or a bobcat which is a small machine operated by one person with a blade about this wide (indicating). Because we are only going down 6 inches and we need shovels or a bobcat to be able take 6 inches. A backhoe or a larger machine-there's no way to regulate how deep you're going. That would be what would be seen in the people's yards is a bobcat and the shovels and there would be noise and there would probably be about 1 week where, from start to finish, in each yard. That's an estimate and of course something like inclimate weather would extend the time. We estimate about 1 week where from the point where the bobcat and shovels are brought on to the property to the point where everything is taken off and what was there is replaced. What we'll do is the same thing that we did in La Salle at the utility site, they-took pictures of the yards before they went in there and they replaced anything that they took out. If there

was grass, they put sod back in. They dug up tress and we won't do that, but if there are small bushes or small plants, they replace those and that's the same thing we would do. I guess that's about all I have to say about it, except, one more thing, the cap that's to be put over the pile, the reason for that is basically twofold. The first reason is so that people, if they get past the fences that are already up can't actually have direct contact with the waste materials. The way it is now, if you could get over the fence, you would be exposed to lead directly because you can walk right up to the pile. It would provide about a 3 foot barrier from that happening. Also and the main reason for a cap and the reason it is so many layers and it has a liner on it is so that when it rains or when snow melting occurs, the water doesn't seep through the waste material as readily as it would without the cap. Most of the water is deflected around the pile and therefore would hit the grass and clean soil on top and be deflected away instead of going down through the pile, possibly picking up lead or cadmium or any other metals that are in that pile and getting down into the ground water and moving away toward any wells that might be in use. That's the primary function of that cap. We didn't find any ground water problem. There was one well that was drilled right next to the pile and it had elevated cadmiums, zinc and magnesia levels in it, but it was physically right next to the pile. We drilled some wells. . the direction of ground water flow is is roughly this way (indicated) and we drilled 2 wells down grading, or down stream in the ground water from the pile and we didn't find anything in those wells that was significantly higher than the background well which is up here (indicating) and

also one up here (indicating). Those measure what is coming into the area and we also measured what was going out and there was no significant difference. But part of the plan will be to deflect water away and also to continue to monitor the ground water in case there is a problem in the future then there will be some action taken. Any legal agreement that we would enter into with the potentially responsible parties and we do have 270 of them identified, and some of them are companies like General Motors and _____Battery, so we have some fairly large industries involved. Basically any legal agreement would have to have contained in it some kind of plan or statement to initiate a plan to take care of any ground water problem that might occur in the future, should any materials migrate toward the wells and get to the wells. And also to patch up the cap if it should ever erode away or somehow get dug up. And one last thing, there would also be legal deed restrictions placed on this property so that no one could build on it or otherwise excavate it and get back into the waste material. That's about all I have to say.

Kittle:

What about right underneath the pile. Right underneath. Not the sides, right underneath, what about that.

Bradley:

Well, physically the pile is about 20 feet high. There is only one thing that we did to check it, you really can't bore down through it, like you would do in the soil, you can't drill a well through it because there are big chuncks of slag and it would kick up dust. But what they did do was while they were throwing water at this operation, they took a backhoe, brought it up on top and dug 2 test pits down into it. There were no samples taken, but what we wanted to determine was what was

really down at the bottom, what did it look like before they started piling this on it. What they found was clay which is actually a good thing because that is a natural barrier. Its not continuous, not like they laid clay underneath the whole thing, there's a few spots where I'm sure it isn't intact, but they also did some borings around the side of the pile and confirmed, I think 8 out of 9 of those borings had about a foot layer of clay. We didn't test what's down at the bottom and I'm sure it would have lead contamination, it would also have edman (?) contamination. The thing is that's down at the bottom of the pile, no one can have direct contact with that, the only problem that would pose is if it would get into the ground water and get to someone's well where they would be watering the lawn, washing their hands, or even worse, drinking it. And we got the wells there to protect that situation.

Kittle:

How far down did you bore, how far down are the bore holes.

Bradley:

O.K., there's 2, there are shallow wells and deep wells and the shallow ones are about 25 feet down and the deep one's are about 35 feet down. Part of what we plan to do, now the _____ for underneath this site goes down to about 120 feet below where you stand, so one thing that we did identify in our comments to the study and the studies were conducted by NL Industries with our oversight on their legal agreement they have, one thing we determined what we needed some deeper wells to check that. There was nothing at 25 or 35 feet but we need to go down maybe 80 or 100 feet to see what happens. Then again, if there is anything down there we would have a plan to pump it and treat it or do whatever was necessary to take care of that.

Kittle:

You know if you have like a balloon or something and there was just a puncture hole here and there, the water is still going to leak out of the balloon and so you got a clean liner under there, unless its smeared thick like peanut butter, you know, a hole is a hole is a hole, its going to leak through and its going to migrate with whichever way the flow of water is going to go and I don't see how it could keep from contaminating our ground water somewhere along the line.

Bradley:

Well, that's a good point, thats why I said its not continuous. It wasn't something that was built for that purpose, it just happens to be there. Yes, that is a concern and when you leave something in place, you have to address what can happen as far as someone digging into it or if it gets into the ground water. And the way to deal with that is again we would drill some deeper wells and monitor it and if there was a situation occurring where there was contamination getting into the wells, its a simple matter to turn those monitoring wells into pumping wells or drill some new wells before you actually extract the water. At that point if you had contamination going toward the well, you would contain it, it wouldn't get beyond the influence of those wells. You would contain it, pull it up and you would have to treat the water that you pull up.

Kittle:

How many wells are around, how many wells did you dig around, how many burrows did you have.

Bradley:

Eleven.

Kittle:

Eleven?

Bradley:

Yes. There's 1 right across the street from here (indicating), then up in this area (indicating) there is a series of them along the one side (indicating) and then there's 2 up in here (indicating). One you can see it on 16th Street and 1 right up in here that was drilled (indicating).

Kittle:

How many burrow are you going to make off the site, away from Taracorp to see if the water has leaked through.

Bradley:

These wells are outside the site (indicating) actually off the site.

Kittle:

But I'm saying it could go down lower than the wells you dug so far and leak out a block or so. . how many. .

Bradley:

What we plan on doing is putting in at least three deep wells and by deep wells I mean 80 to 100 feet. We would also put up at least one upgraded deep well so we know what's coming in. We would know within the year and we would also check the deeper zone of that same aqua with at least 3 more wells and they would be directly downgraded so they could tell us whether anything had gotten in there.

Walden:

Would this plan that we have at present, it appears that we are going to have a permanent toxic waste site in our city and as you stated they will be bringing toxic waste from other areas to put on this pile, how can we be assured that in the future we don't get toxic waste from other cities and end up a whole toxic waste site.

Bradley:

Alright, there's two reasons that won't happen, one of them is Taracorp is a business, they are not an approved landfill. They would have to give consent to let people bring things onto their property. So that's one reason. I don't think they want to accept the liability, they have already had enough of a problem right here. And the second one, the reason it really won't happen even if Taracorp decides they like the idea, there are requirements under the Resource Conservation Recovery Act that that can't be done. If it were to be done, it would be against the law and they would be liable for penalties. So there are other places to take waste and it would be an easy choice to go their first if you have a bunch of liability facing you if you go here. That wouldn't be the plan, it would just be to cap that pile and there are requirements in the laws as they are we don't have to write them into any agreement to prevent that from happening.

Unfried:

I'm going to ask you to back up a little bit. First of all I see that the curves down here from in excess of 5,000 parts per million right at the dump site to approximately a 200 parts per million or less some distance away. Fine. What I understand you to say or what I understood you to say was that 500 parts per million is "an acceptable limit". Tell me what happens to the human being and how do they get this lead into their body and what happens when they get the lead in their body. At 5,000 parts per million, at 2,000 parts per million or whatever.

Bradley:

I think Dave would be better. . .

Webb:

First of all your talking about exposure to it and getting it into your body.

Unfried:

O.K. tell me how.

Webb:

First of all we have to go over lead a little bit, just real brief health text. The effects that it has on adults are not nearly as pronounced as children for two reasons. Children are just inherently more susceptible and they absorb more. They have activities that get them into a situation where they are going to be exposed to more lead. For example they have hand to mouth activities. If there's lead in the soil and they get it on their hands, they stick their hands in their mouth.

Unfried:

Kids get dirty, right.

Webb:

Right and they have a tendency to have hand and mouth activities, they put toys in their mouth, that's the way they are going to get it, they are exposed higher as far as soil. Now if its in the air, the child has a larger lung capacity per unit body weight, so they are going to have higher absorption that way, just higher exposure. Also in ingestion, adults absorb somewhere around 15% of lead in soil whereas children go up to 50%. O.K. Since one of the main health concerns is lead is on the nervous system. Since the child's nervous system is developing it is more susceptible to the effects of lead. What was the second part of your question.

Unfried:

Alright now we know how it gets into the body, what does it do once it gets there.

Webb:

Like I said, it works on the central nervous system. .

Unfried:

So does alcohol.

Webb:

That's true, but you don't give your kids. . . .

Unfried:

Working on the central nervous system didn't really define what it does, are we talking about instantaneous death, no. Are we talking about mental retardation? I don't think so.

Webb:

There are studies that have suggested that it does lower IQ's at certain levels of ingestion.

Unfried:

At what part per million of ingestion over what period of time.

Webb:

The way you would have to look at it would be what they do is get blood lead levels and the thing that makes this more complex for one thing, this is purely soil now, most of the studies that have been done prior to this have been at secondary smelters that are still active, they also have a very high lead count in the air. They are not only looking at the soil in those situations, you're looking at lead in the air, also with active smelters you've got a lot more dust that has lead in it.

Unfried:

I think we're leading up to what I was aiming for. Though I understand your approach, wet the dirt down, keeps the dust down, still you are transporting "hazzardous material", it is going to blow off. You are going to creat mud, muck, dust, dirt, corruption. It's going to be airborne, yes its one thing I believe for a child to play with a toy and pick it up handle it, put his hands in his mouth, eat a sandwish without washing, kids do that, alright. But your generating more of it. Now its captive in the soil, even at 2,000 parts per million at 5,000 parts per million. It is trapped. Eventually it will be washed over with other fallout in the atmosphere and it will be buried six inches more and six inches after that. I am of the..and maybe I'm wrong and I'm willing to accept being wrong, but I see doing more damage through inhalation of this byproduct than by stepping on it, walking on it and kids putting their dirty hands in their mouths. I see a need to clean up the 5,000 part per million area to keep it contained, but that is the dump site. And I think 5,000. parts per million is maybe a ridicuously low number if that is in fact the dump site because 5,000 parts per million is really not that much.

Webb:

It doesn't seem like that much if you think of it as a part per million.

Unfried:

That's exactly what it is.

Webb:

One part per million is on in a million. However health effects for a lot of chemicals show themselves very low values and for lead, unfortunately for lead the interpretation of what concentration in soil is a health problem is subject to a lot of _____.

Unfried:

So what I'm looking at here, is we're looking at a tremendous expense, a tremendous inconvenience for property owners and residents, an eye sore, something that possibly may run down the value of the property in the area, possibly not. I'm trying to be as passive about this as I can be. The point is, I believe you are actually going to generate more of a hazzard treating the hazzard.

Kittle:

Aren't they going to put a tarp over it.

Bradley:

No, they won't do that.

Unfried:

So you have a tarp, you take a dump truck, full of dirt, with a tarp over it, hit a bump, knock a chunk out 4 inches by 4 inches by 4 inches, big chunk, and that gets spread out, dried out by the summer sun and out in the air. Ingestion is one thing, inhalation is another. I can see how both can do damage and in a child, I would assume that because their lung capacity per body weight is considerably more than an adult, you would actually be generating a situation where the child would be in a more hazzardous atmosphere than if you just left it alone.

Webb:

As far as breathing I assume you would, I don't know how much dust you stir up when your remediating, I've never seen any studies on it.

Unfried:

Go to a coal mine, go to a strip mine and see how much dust they generate. That may be clean top soil and all it does is give you an itchy nose and you blow your nose and its over and done with. But the point is when you remove soil you generate dirt, you generate dust and there's no..you can't change it. Its the laws of nature, laws of God and you stir up dust you're going to breath it.

Bradley:

We've done other grading or excavations at other sites and with materials that were harder to wet than just plain soil and have done a very good job of controlling the dust. There is no way to say that there is none of it that would fall out or one of the critical points in digging anything up is when you lift it into the truck and flop it over the side does any fall down the side of the truck. There's no way to say that none of that would happen, but I'm confident that we can keep the dust down to where it wouldn't create an adverse health impact. And what we are looking at basically is in the long term this is a better thing that would be more than just the potential for dust, there would also be truck traffic in the short term, so its a short term potential problem to take care of a bigger problem over the long term.

McDowell:

There's been a lot of talk about whether or not there should be a public screening for the drawing of blood in terms of exactly if there is a problem or not. What we're hearing is yes there's a problem, that there's lead there, but after talking to a pediatrician this afternoon and talking to a pathologist at the hospital, there is not a problem with lead contamination in the city.

Tape 2

I've been informed to know that there have been no studies done of animals in the city to determine whether or not there is any blood level contamination. It would seem to me to be fairly logical that you would do those studies first because after speaking to those two individuals, we're talking about only a couple of cases where they have seen any positive results and they would have _____. There simply is not a problem with individuals having a problem in the city. So, if we do in fact do a public screening and there are not abnormal blood levels of lead, then why go to this expense of a clean up if in fact there is no problem with it.

Bradley:

I don't admit to being a health effects expert, I just know what has been told to me from people who review risks assessments in my office and also people with the agency for toxic substances and seize registry and there's a lot of problems with blood lead studies as far as what time of year you do it an interpretations and results. Actually turning to the rest of the discussion to Dave for that, I just want to make one thing clear, this, first of all this isn't the right conture map, this is from a 1984 or

1983 study, so it does look a little different, but this is not an immediate health threat. If it were, if it were something where there would be an immediate potential impact on public health, we would have come in here in a much shorter period of time and taken care of it without really studying it so heavily, without really going through the drawnout process of studying, recommending and writing it up into a decision, designing it and then finally doing it. We have two programs. Under the remedial program, that' s this lower one, we also have the removal program, and those people, they respond to transportation accidents, situations where we got drums leaking and no fences and kids playing in there, situations like that. This is not one of those situations. That's why we've done a fairly extensive study, generated a lot of data and also analyzed that and recommended what to do in this case. So one thing we don't want to leave people with is the impression that this is some kind of immediate threat, that they are going to drop dead or something like that. I'll let Dave say a little about blood level studies. Kittle:

Could I just say one more thing, I'm not so worried about breathing it, is that it leaks into the ground water and if we don't get it that our grandchildren will get or our great grandchildren will get it and like I'm going to kidnap you both after the meeting and we'll go to my office because I was the court reporter on the Wilsonville case where they took the products from Missouri into Wilsonville which I was telling you before and like I don't even know if I have a carbon of the transcript, but if I still have it and its probably been 15 years ago or, I loose all track of time, but, the Illinois E.P.A. won their case and they proved that, I don't care, they had good

aqua, they encased all this stuff and they had, you know, they had low permeability, I'll but it that way. And they proved, the Illinois E.P.A. proved that it would leak through and hit the Cahokia stream in 50 years and our grandchildren and our great grandchildren would get it and I mean they had a better set up for containing it than you do, and to me if you're saying that and they won their case on this other thing, then that's a double standard if you don't make them take that pile and get rid of it because they made the folks take the stuff out of Wilsonville and cart it back to Missouri.

Hopkins:

Jeanie, in all fairness to Mr. Bradley and the E.P.A., the chemical, the Wilsonville situation involved a whole hodge podge of all kinds of different toxic chemicals. Some of which could cause problems on touch. OK, this is not the same thing that we are talking about here with the lead.

Kittle:

That's true, but my point is, this was placed on what you could call a rock pile, you know. A clay liner and everything, and I'm talking about the permeability and the availability for it to leak through rock besides the clay and in only 50 years and it takes you like 2½ hours to drive there, it will leak through the Caholia stream. I wonder how close we are to that pile, I don't care if it is lead. I don't care if it is lead.

Hopkins:

I think everyone understands your concern, but the question that was going to be addressed is whether or not there is any tangible scientific evidence to substantiate that there is any health hazzard from the lead.

Kittle:

And if it gets in our water.

Hopkins:

We're talking about now, we're talking about whether or not there's anything that proves there is anyone having problems now, that's what Dan was talking about. He had discussed this with different people at the hospital.

Kittle:

Well you see they weren't having problems then in Wilsonville.

Hopkins:

But Mr. Webb from the Public Health is going to address the situation about the effects of lead again.

Webb:

Dan, I think what your asking is if a health survey was done on animals, children, and adults in the area and it showed that there wasn't a problem with lead poisoning, then what would be the purpose of cleaning up the area at all, is that essentially it.

McDowell:

Somewhat.

Webb:

Like I said, with these lead studies, the studies that they have done with high lead in soil, they've also had a problem with high lead levels in the air and in the dust and there are a whole bunch of factors that are all meshed together and its had to just tease out soil and say in this particular instance 500 parts per million or a 1,000 or 2,000 is the cause of the problem, its not only the soil, its a combination of factors. All the food that you eat has some amount of lead in it. In this situation, I don't know if there is a problem. We did a study but the study was not a perfect study and they didn't do enviornmental survey or anything else.

Participant:

This study was when:

Webb:

1982. The one that I'm talking about.

Participant:

Not a problem back then.

Webb:

Right. The level in a lot of things have changed. They used blood lead and EP levels and both of those, I think the EP level at that time was 50 and you had a blood lead of 30. You had to exceed both those to be considered to have a problem.

Participant:

What's the EP?

Webb:

Its actually FEP, Free Erythrocyte Protoporphorin. What that is.

Participant:

EP didn't mean a thing.

WEBB:

It interferes with the syntasis of _____. You get this. Instead of getting E to form hemoglobin you get the free erythrocyte propoporphorin. So it shows over longer period of times to lead exposure.

Unfried:

You're talking about a break down of red blood cells.

Webb:

Well actually they are not allowed to form totally, so you have this-problem.

Mc Dowell:

The gentleman that they test, if the EP values are not exceeded then they don't even do the second test.

Webb:

Right, but in this study they did both, just to be able to compare. But you know they did have problems with them.

Unfried:

And the results of that.

Webb:

It didn't show any combination of an EP and blood lead over those valuews. Now it showed blood lead over 30, but there wouldn't be an EP to go along with that and vise versa.

Participant:

Now I understand it wasn't a perfect study and it wasn't probably done as many people would have like to have had it done and maybe not at the right time that you would have liked to have seen, but this was back in 1982 when the smelter was still in operation.

Webb:

The smelter closed in what?

Bradley:

I think it was '83.

Webb:

The lead levels in the ar, if you look at the air sampling that IEPA did, it was going down at that time. But it was still higher than it is now.

Walden:

There's another thing to consider, since 1982, the value in blood of, the blood lead value that is considered to cause some kind of adverse health effect has dropped. Its not 30 anymore.

Webb:

Yeah, its 25 now.

Unfried:

Well even if it were 15 or 10 or even 5, it seems to me that the more economic approach and perhaps more logical approach would be to screen a few volunteers and/or whatever other means might be available and obtain current data and from that point make a decision as to whether you're going to dig up the city.

Mc Dowell:

Who can really. . .we talked last night very briefly and I understand that its along the plan to pursue the possibility of having a mass screening of some sort.

Webb:

Right.

Mc Dowell:

I assume that can in effect be done, can be done before you do anything at all, is that correct. Would you be interested in that type of study before you. . .

Bradley:

How long would that take, before you got results back.

Webb:

Probably the most difficult thing is it takes funding and manpower. We'd have to get that up here, I don't know how long that would take or whether or not it would be possible. But if it would, it wouldn't take too long to get the blood lead, you can usually get back in a week. The only thing is if we have our our lab to it we can only send in a certain amount a week and I don't know what that is, we'd have to check that out. Depends on how many-people you wanted to screen, how far away from the site. So I really couldn't give you anything definite in time, I don't know. It was going to be six months or a year before you started mediating.

Bradley:

Before we actually did the work that we're proposing, this plan that we have put out for public comment, that time frame would be about the summer of '91, so there would be time before actual work was done, however, the importance of this period right now, up to February 24th is that this is your chance to give a comment on the document which will be written in March by the end of March which will give the decision of what to do here. So even though the work won't actually start for another year and a quarter, the decision of what to do will be made sooner. There is some leeway in how that decision can be interpreted, but it can't be a major change or it has to be entirely re-written and all that.

McDowell:

But if the decision is made to do alternative "H" of the proposal in March, if that's the decision that is made, but we find out in April that there is no significant increase in lead blood level whatsoever, then in fact it is. . . then if there is no blood level contamination in the city, then can that decision be changed?

Bradley:

It can be, yes.

Hopkins:

Does everyone understand basically what the framework is, that the EPA has, there are at present 6 or 7 proposals regarding what to do with the Taracorp pile, ranging from do nothing and just leave it alone and put a fence around it, up to the proposal to take the dirt and the yards, rather the pile, the dirt and everything else and haul it the hell out of the city and various things in between. The EPA has a proposal, which is listed as, which Dan referred to, as alternative "H" which is their recommended proposal solution. That's what outlined on the first.

Kittle:

Does one of them show that they take the whole pile, I thought none of them showed that they would take the whole pile out.

Bradley:

We take a look at a range of alternatives so that we can have one that does nothing or we have one that you can do, the equipment is available, but it. . .

Kittle:

To take it out, 100%.

Bradley:

We usually have the last one we do, we have a range from nothing to something that is very expensive, can be done. . .that's alternative "G", its right before the one that. . .

Kittle:

To take it out.

Bradley:

Yeah, to take it out. It usually very expensive and for the most part creates a short term problem, such as lifting out that pile and a lot of times it includes hauling materials great distances, but we usually do, the last alternative we do is getting everything out. Either getting it out, burning it or getting it out by taking it somewhere.

Walden:

How near is the closest EPA hazzardous waste dump that it could be moved to.

Bradley:

I'm going to say Fort Wayne, Indiana. I might stand corrected on that, but it has to be EPA approved and there are some landfills that are closer, but they have problems with their operations, so we wouldn't be taking it there.

Kittle:

Can you ... bear in mind that its not just what's going to happen to us now, but down the line, to our children and our children's children.

Bradley:

Right, we have nine criteria that we judge the alternatives on and one of them is long term effect and that's exactly what your talking about. There's another short term impact of actually doing the work, digging up yards or digging up a pile and costs is one and there are several others like can you actually do it, do you have equipment that can do it. We use those criteria.

Kittle:

So what are you going to do when it leaks into our water cause our water taste bad around here now.

Unfried:

That lead won't get into our drinking water because that comes out of the Mississippi.

Hopkins:

We have a question in the back, Brett.

Bradley:

I told you what we would do about the water.

Henke:

Relax John, I'll behave myself today, you too Brad, I'm not going to get on your case.

Hopkins:

But you've got something in writing which is always a dangerous sign. . .

Henke:

I'm getting prepared, I'm not going to give my speach tonight. I probably wouldn't have given it lastnight, but you guys irrated be last night. First of all I would like to point out that my son Joey, who is now 10, was in the 1983 blood study. I didn't know that until I got back home and talked to my wife last night, they sampled him. Remember the filth monster I talked about, he was in that study, he was 2 at the time, but I don't guess he was out in the dirt a whole lot, but any case, how, I understand that you are saying essentially that this May drop dead date for making the decision is very, very firm. The EPA is going to make a decision in May is that correct.

Bradley:

I said March.

Henke:

March, I'm sorry.

Bradley:

Its firm in the sense that we want to move this thing toward a resolution, but no, its not unchanging.

Henke:

So there is a possibility that you could decide to do what I had recommended in our initial thing at the KC and that's get together and do what you agree to do and do a little more study on the rest, that's a possibility.

Bradley:

That is a possibility. In fact that could be written up by March, it wouldn't be that hard.

Henke:

That certainly could. Huh, OK, I just ran some quick numbers here, Mr. Webb is with the U. S. Public Health or the Illinois. . .

Webb:

No, the Illinois Department.

Henke:

Illinois Public Health. I did some quick numbers. You made an interesting comment, children will absorb into their blood 50% of the ingested lead.

Webb:

Right.

Henke:

And I believe we talked a minute ago about 25 parts per billion being the acceptable blood lead level in a person before they are actually considered to be sick or suffering ill effects.

Webb:

That is the standard they have, they found that lead is a well studied compound, they found that they've seen effect down as low as 15. OK, which is why they are considering changing the standard to dropping it either to 20 or 15, I don't know which they are going to do.

Henke:

OK. I ran some quick numbers out and unless I made a medical error, which is entirely possible, a child would have to have ingested at 500 parts per million, the recommended clean up level in order to have an adverse health effect due to high lead levels, this is assuming the body does not purge itself of any lead whatsoever, he would have to have ingested 75 pounds of dirt. I figured this based on three pounds of blood in a child's

body and I'm not. . .a pint weighs roughly a pound, so you're figuring somewhere in the neighborhood if my ratios are right, about a 30 pound.kid which would be my 4 year old Willie, who may have very well ingested 75 pounds of dirt. I guess my last question would be what recourse would he have if the citizens who lived in this area absolutely refused to allow their yards to get dug up.

Bradley:

Steve Seigel, our attorney, answered that question last night. He said that we can get an order to go on people's property which is something we certaionly don't like to do and we have another choice, we could not do it and then what's left is whatever level you got in the yard and people who may want to buy the property will test that and know that and it won't be gone.

Nonn:

Have any of the yards been tested.

Bradley:

Yes.

Nonn:

Where?

Bradley:

We don't have that up here but.

Nonn:

Since 1983 or '82 whichever it was.

Bradley:

This is an example of contour lines that are drawn from the sampling effort. this is from the 1983 study. In 1987, we took about 50 samples at 1,000 foot intervals, roughly indicating a one mile sweep around the site. Tried to fit them in to a one mile sweep around the site and it generated more data which we

added in the place here (indicating) and these contour lines indicate where the likely condition of a 1,000 part per million would be based on that data, 500, etc. So there was sampling done and we don't have the actual points, but we came through and got access to quite a few properties and I was involved in getting the access. Actually it was NL Industries' responsibility to get the access. I was there in case they had some trouble explaining themselves. And in general we had pretty good success rate. So we did do samples throughtout this neighborhood, I just don't remember the exact locations.

Unfried:

Are the test results available to give concentrations per depth?

Bradley:

What we did, this study I believe took 1 inch samples. What was done in 1987 was 2 intervals, 0-3 and 3-6 and that column of soil 0-3 would be taken off and analyzed, so you would know an average from 0-3 from that sample. 3-6 the same thing, you would know from 3 inches to 6 inches what the average lead in that depth was. Those values are available, there in the remedial investigation report which is at the library.

Unfried:

Do you recall what they were.

Bradley:

I can give you a general idea. There were several that were up around 3,000 out in here.

Unfried:

At what depth.

Bradley:

0-3 and about 2,000 in the 3-6. I could be wrong here, I'm trying to remember it.

Unfried:

Well, 0-3 doesn't impress me because 0-3 takes in in the surface to three inches down. Agreed that a 7 year old that I have or your 4 year old dig holes. I am under the impression though that having worked a little bit with dirt, crud and corruption that this is already down before the surface point. This is at a 1 inch or 2 inch depth. At that point its fairly well contained. I think and its just my humble opinion, but wouldn't we be, and maybe I'm sounding like I'm harping, but wouldn't we be better off determining is it all worth while or should be put say a small stop gap on this, determine if we still have a hazzard and then proceed. The test results, and I didn't even know they existed, back in 1982 when the smelter was in operation and airborne lead particles were available for inhalation which I believe is a more rapid way of getting into the body than ingestion, and yet we were below study levels 50, let's try again. If there is a hazzard, then let's do something about it. If there's not a hazzard, regardless of what your figures say, because that's a lot of industrial area that your digging into right there and commercial.

Bradley:

We would be digging just the residential.

Unfried:

Areas that you are saying are 2, 3, 4,000 just commercial and industrial.

Hopkins:

The further away from the actual pile the less the concentration is, correct.

Unfried:

Sure.

Bradley:

There's always a few. . .

Unfried:

That also happens to follow the prevailing wind. So say that it got there by airborne contamination.

Bradley:

That's the primary source.

Unfried:

OK, now airborne contamination no longer exists. Right?

Bradley:

We can't say that.

Unfried:

What's generating it.

Bradley:

Taracorp is still

Unfried:

So put a cap on it and then it goes away.

Bradley:

No, No,. Taracorp still works with lead, there is still lead coming out of the bag house stacks. You still have. .

Unfried:

What percent is it.

Bradley

. . . I don't know what the percentage is.

Participant:

Close them down then.

Bradley:

OK.

Walden:

Is it definitely determined that this lead pile is the only source of airborne lead in this city?

Bradley:

Well. . .

Walden:

Is it the only source right there.

Some of the airborn lead in this city will go other places.

Bradley:

OK, there was a study done in early 1980's because there were levels set, the levels 1.5 micrograms for lead cubic unit for lead in air. The standard was set, monitors were placed in industrial areas throughout the State and those which had lead levels over that 1.5 number were required to do a further study to try to find out where it was coming from. The primary source was the smelter stack here. St. Louis Lead Recyclers was also operating. They were taking lead off of the pile and reprocessing it trying to recycle lead and generating their own pile in the process. And the pile was also listed as one source. There were also some other sources that were listed, but probably the best way to indicate where the real source of those high air levels were is to just look at when Taracorp smelter shut down and look how the air levels went right down with it.

Henke:

The risk assessment is going to doubt that subsequent testing to the shut down of the smelters and the air levels in Granite City are I believe its .2.

Tape 3

Henke:

There doesn't appear to be a lead problem in the air at this time.

Bradley:

Right, and that's not what were saying.

Participant:

Airborne seems to be how we got it, you seem to suggest that you're pretty certain that we have those contamination levels, my first two questions, after you do all this, if you're still working with lead that's still airborne, even after you do all this which seems to be a very radical move to me, 20 years from now do we have the same problem. If there still processing lead and putting lead into the air, after we do all this, take the contaminated soil away, and your continuing to operate a lead processing plant that still has airborne chemicals coming out in the lead, it seems like you clean up this mess and you would have to clean it up again maybe in 2020. The point is, does anyone really want to live in this city that seems to be a very polluted area and its going to continue to be polluted, even after you do all of this.

Bradley:

Often times the different programs don't necessarily mesh with each other. There is an air program and as far as their monitors indicate, this area is OK for lead in the air. You got to monitor right around the Taracorp site and there indicating that its about one seventh of the present standard. But Taracorp still does operate and they still do have some lead coming out of the stack. They have bag houses on most of their processes and they claim they get a 99.97 effeciency removal on that which is really good.

Participant:

Basically what you're saying is that your not going to have a secondary problem with it. You're pretty assured that once this problem has been remedied, they are not going to creat this same problem, airborne pollution, by their operations now or whatever time they continue to operate.

Bradley:

I would say that if they continue to operate the way they are now, they would never reach the magnitute that it is today, in the soils around this site. They would be putting out some lead there's no way that is not happening.

Participant:

What kind of future problems after going through a very extensive removal process, disrupting the community, is there really assurance that you are not continuing the problem. Who wants to go through this, we might not be here, but years from now, you hate to dig up the same yard you dug up this year to correct the same problem 30 years from now.

Bradley:

I understand what your saying and that is a good point. To get to the levels that these are today, it was 80 years of operating at an extremely high emissionary, well over that 1.5. this is one of the worse areas in the State. It may have been the worse. There's much dust now and.

Participant:

You can assure us there is not going to be this problem again.

Bradley:

Right, I'm not going to say there's not going to be some lead, its just certainly not close to the rate is was in the past. They used to oprate unchecked. Just no one thought about it back then. They weren't required to put anything on the stacks.

Davis:

Have you ever just left a site and not done anything to it.

Bradley:

Yes.

Davis:

You have? And what has. . . .taken place, have the dangers leveled.

Bradley:

Generally the dangers, it would be. . .if we came in here and found that the levels were 200 or something, thats the kind of site we leave alone in general. There are some sites, they go through a scoring process to get on a national priority list and if they are above a certain number, then they get on that list and they are eligible for clean up. Sometimes a situation changes from the time when they grab the data to do the scoring to the point where we start to study it. So there is a study done and a process is eliminated or someone even does a clean up action in the meantime and we come up with a no action alternative and sometimes it just seems like they should have never been on there in the first place, given what was there at the time when they did grab the data. Those, we call those no action decisions and they are fairly rare, but they do occur.

Davis:

So in other words, if you would leave this go, not do anything about it, are you going to come back in a year and still be on a bandwagon sort of thing to say that we have to get this taken care of or do you completely leave it alone and say well. .

Bradley:

Well, its hard to say because here's what could happen, here's what may happen. If we were to say OK, its fine to leave, let's for example say we take 1,000 parts per million which is something that NL Industries has proposed. There is no standard for lead in soil today, but it seems like every time another study is done, the trend is for lead standards to go down. If there ever is a lead standard set, there will be sampling data on record showing that you are over a standard that may be set and that could cause you problems. What's happening in recent years, in most cases, when people buy property, they have someone check it first. It didn't use to be that way, but they have it check it, especially in business transfers, to make sure they are not picking up some kind of problems when they pick up that land. So the people who would come in and buy a house may check that and it would show to be high levels and you would have a problem selling it. I don't know what standard will be set. If we were at that point it would be a lot easier. We're not there, so that's what could happen, so to say there is no action, yes there would be no action as long as there is no kind of standard set where you're not over it, then there would be a big evaluation that would have to be done as to whether its worth it to come back.

Participant:

The property values in this town are going to be dead anyway once you have Taracorp even sealed. Its going to be like Times Beach, its going to be everywhere, you're not going to have people flocking to Granite City to buy uncontaminated yards. Its history.

Henke:

That would depend on the press. If it can be kept low key. The city and the mayor are very concerned about how the press addresses this and how its handled by the media. My question was if in fact EPA and the industries were to agree on a choice of action say in March, when. . .would it be any quicker that they would begin to work. Could they begin to work this summer say and get some of that work done.

Bradley:

It would depend on what the agreement is. A lot of the reason that its a year and a quarter off is that we didn't get enough samples to know where to stop. There may be a person who lives right here (indicating) and we didn't have a sample in that particular yard we're going to have to check all that and make sure we didn't just draw these contour lines and interprete it and its wrong, that's the interpretation it may not be born out in reality especially when you see something like this where it goies down and back up, it makes you wonder.

Henke:

Is it going to take an additional year to better define whatever the area is that is going to be addressed, or is there a possibility it could be expediated and things get started sooner . . .

Bradley:

It could be expediated, but there would have to be some sampling done.

Henke:

I'm sure there would.

Bradley:

There just wouldn't be as much.

Henke:

It would just appear. . . the only bone of contention apparently between EPA and the industries is whether or not to dig up the soil which is between 500 and 1,000 parts per million. Everything else they agree to and we went through this before.

Bradley:

Right.

Henke:

Twice. it would just appear that in the interest of expediating the whole thing, EPA has absolutely nothing to loose by agreeing to do those things that you agreed to do and then doing more scientific study to satisfy, if nothing else, the population here on the need to do the 500 to 1,000.

Bradley:

Well, I think that's a good suggestion. One thing you got to realize NL Industries is not the only party involved anymore. They have been the only one up to this point.

Henke:

They're just taking an active role.

Bradley:

There are still under a legal agreement to finish that and it is over when we sign the record of decision which is supposed to be in March. Then the other 269 will have their chance and they may have a different opinion than NL Industries. So its really, you know we're smacking up against each other, but those extra 269 may push us back in farther, they may say NL's off the wall.

Henke:

Well they may and then NL may decide to pick up the burden of the responsibility and just pay the bill if they feel it is reasonable. I don't know that. . .

Bradley:

I would doubt that.

Henke:

I have one other question for Mr. Webb. Is there any standard for how quickly the body will divest itself of any blood lead level.

Webb:

As far as say a single exposure and then what. . .

Henke:

How fast does it go away, say you ate a pound of dirt today how long would it take for that to go away.

Webb:

To go away you're speaking of the blood stream, right.

Henke:

Right.

Webb:

Because it will also store itself in the soft organs the tissue, the bone tissue and of course its excreted. I couldn't answer just a single exposure like that. Say for example an inhalation exposure of one day, it might last, there are different time periods that it will stay in the blood and the blood may be three weeks and it (inaudible) between bones and the soft tissue, but that first day it may be way way up there.

Henke:

There's really no standard then of how quickly the body will . .

Webb:

Excrete it, no.

Henke:

OK. It will eventually, I assume, do that.

Webb:

Right, if there's no more exposure however. You blood level may stay up there for several years if you have what is called a high body burden, body burden, the other storage compartments in your body, other than blood have lead in it. If your bones have a lot of lead in it it will keep your blood level up there for months and possibly years after that.

Henke:

My wife tells me I have a lot of lead but its not in my blood.

Bradlay:

One thing to add to that is in interpreting any of the health data that is ever generated, you have to realize that people have a different very reaction to the different chemicals. Some people, just like some people can smoke all their life and be fine and other people are taken by lung cancer at a young age. So what EPA does is we design these remedies for the more sensitive individual and with respect to lead it the same as anything else. There are some people, especially children who have a tendency to eat a lot of dirt that could be very sensitive and that's how we design this basically and that's why we selected the lower of the two numbers that you heard going around.

Hopkins:

We have time for a couple more questions.

Participant:

Two quick ones. There was talk last night that the pile at Taracorp growing larger and you said you were going by there this morning

Bradley:

I went by, its not any larger.

Participant:

So that's not correct.

Bradley:

No, I'm still not sure what she was referring to, it may be something else that's growing, but its not that.

McDowell:

Both individuals that I spoke with at the hospital the pediatrician and pathologist expressed surprise that you would be looking at lead here as opposed to East St. Louis where there is a severe problem. Now I don't know if there is something to clean up down there or where the lead is coming from, but its acknowledged that they are having a severe lead problem in the population.

Bradley:

I don't know.

Hopkins:

A monster of a lead problem.

Webb:

Yeah, they do, they have a very high level of lead poisoning in children down there, a lot of them had to be treated for lead poisoning and a lot of these cases, for a long time, you know, they were saying there was lead in the paint and in fact our department one time had a lead program at the height, there were a lot of people down there working to check out for lead paint. Now they have done the environmental investigation where they have checked out the paint in the houses and they've taken dust measurements in a lot of them and found a problem. We took some soil samples down there and we haven't had them analyzed yet,

we've had a couple of them analyzed but its not enough to make any generalization. There is one particular site on Great Boulevard that has really high lead levels in the soil and they do have lead poisoning, but there are other places where we don't suspect from the soil that they have that problem. It gets in here another problem of lead, its different among different groups of people. Different socioeconomical groups, we don't know why in particular that they would have high lead levels, blood lead levels and not have high soil lead levels. In fact we have taken air samples down there and we are still trying to determine if the cause is environmental, exactly what that is. It might be that its lead plumbing. We're just really not sure right now.

Walden:

Can you explain a little bit how the procedure is going to take place. I have a horrible picture of them coming in, taking all the dirt out and tearing the fences down and then six months later coming in with new dirt.

Bradley:

No, they wouldn't do that.

Walden:

Are they going to take my neighborhood or are they going to get the whole area cleared away at one time.

Bradley:

There are some particulars that would be ironed out when we design it, but what I would anticipate is it would be taken probably by blocks and go block to block in the neighborhood and then move to the next.

Walden:

Would they remove the fences, (inaudible)

Bradley:

No, you can get it out from under there.

Walden:

You would go right up close to the house or just in the yard.

Bradley:

Attempts would be made to come as close to the house as possible. Like I said, there would be a bobcat as well as a shovel and you can dig right up next to the houses.

Walden:

The houses or foundations won't be damaged.

Unfried:

Under porches?

Bradley:

well. . .

Unfried:

A lot of the homes around here have effectively hollow porches.

Hopkins:

How would they get in there.

Henke:

I would invision that the operation would go, probably end up with a couple of bobcats in the yard digging and piling the dirt out and then it would be followed by a crew of maybe one or two bobcats and guys with shovels would be shoveling around the edges into the bobcat and then load it into the dump truck until the yard was excavated and then the next crew move down the block

and probably bring the subsequent crew in bringing the fresh soil in, so at most you're talking at maybe a week for your yard being dug, is dug and then back tilled and raked out and maybe rolled and seeded.

Bradley:

Yeah, its in our best interest to do something like this as quickly as possible because its not the intent to put people out.

Walden:

Why I'm concerned, I have a beautiful magnolia tree thats been there for years and I don't want it destroyed taking any of the dirt, taking the bulldozer right up to the trunk of the tree.

Bradley:

That's a consideration that we can discuss with each person, like I said, we would take pictures before and we would also certainly discuss with you, we just wouldn't show up and start digging.

Hopkins:

Tim?

Elliott:

The thing that bothers me, I'm personally not convinced of the health risks, but already having this picture on the front page, I'm sure every realtor in town has lost any prospective customers to our neighborhood, that's a big concern to us because many of us have spent thousands and thousands of dollars in rebuilding and hours, rebuilding in an old neighborhood and so I guess were we sit now, we feel like we're in between and it would help if the EPA would stress that this isn't a dioxon site. (inaudible) the clean up with the whole plan, people have got to know that lead is not comparible to dioxon, we're talking about apples and oranges.

Bradley;

Well every time that I have been interviewed. . .

Elliott:

We had the hysteria last night, the mother who lived across from the pile with the kids who was sure the kids were going to have cancer and die.

Bradley:

Well we met with her earlier and told her that was not the case, but it just did not. . .

Elliott:

People need to know that this is not the case, we are not dealing with the same type of material when we're talking about lead.

Bradley:

I've told the press several times that this is not an emergency situation and its not a Times Beach.

Henke:

Yeah, but that doesn't sell newspapers.

Bradley:

No it doesn't.

Henke:

The woman's hysteria does, so that's what makes the headlines. Let Brad Bradley say its alright . . .that's the problem.

Bradley:

All I can see, I really don't have any control over how they are going to print the stories. I'll give them the facts which I have done and if they want it sensationalized, they'll find something somewhere.

Henke:

Well, the lady was quoted in the Belleville News Democrat. That was the only quote that I read. Same lady.

Tape 4

Bradley:

We told her at an earlier session that this wasn't an emergency situation, we don't want to in any way. . .an immediate life threat, but its recommended that you would have your children's blood tested and consult a doctor because that gives them something to give you some perspective on, I mean we didn't sample right in her yard, so she might be between samples, where is she exactly, we're not sure at this point, so we recommended that she have the blood level tested. We told her all of that but it didn't seem to help.

Participant:

What do you think the liklihood is for a mass screening to be possible.

Webb:

As far as odds, I couldn't really give. . .if we can get the money which is like I said probably the most important part, you know, it would be no problem, its a matter of if we can get money from a different party or, you know I don't believe our department by itself would be able to do anything like that. So I was thinking (inaudible) what the possibilities are.

Henke:

A mass screening in itself, in a vacuum, is not really pertinent data, (inaudible) you need to know the exposure level of the person, the age of the person, a child with 50% retention of an adult with 15. Is this an active child that plays out in the dirt or a child that plays the piano 10 hours a day and those

are significat factors that also have to be surveyed as well as... and in my opinion, also where that person lived, say within the 500 to the 1,000 to the 1,500 area and all of that data has to be generalized and perhaps adjusted blood lead level adjusted.
Webb:

We would also have to do an environmental survey of the home and check out for example say if there are lead pipes maybe take a water sample to see if there is any lead paint, because these are outside factors. You could have someone way way out there you know across town that had lead poisoning and it would be because of the paint. You would have to check out, you would have to do an environmental survey, check the depth in the house and all the rest of that to be able to determine that that wasn't a factor.

Bradley:

The time of year is very important too because people don't. . .there may be a snow cover and kids to tend to play as much in the winter and the ground is frozen. Summer is really a key time.

Participant:

Based on what you heard so far last night and tonight and based on your experience of what is going on in the past, what do you anticipate the reaction being from the community in terms of what we are going to hopefully recommend as a group and what exactly is going to happen.

Bradley:

I really won't know until I get some comments. I'm sure that I will see some people who will support Alternative "G", just get it out of here. There will be that. There will be some who just don't think there's absoultely any problem whatsoever who will say don't do anything. And there are others who will be

kind of in the middle. I'm not sure what percentage of each we're going to get because the problem with having a public meeting, its a good thing to do, but some people don't speak and they write but they don't speak. They are going to be considered with an equal voice as the rest, but they just did not stand up because they agreed with us or maybe they are shy for some reason, so its really hard to say that.

Henke:

I would like to perceive that you personally would be a very key player in the making of that decision and obviously you don't do that in the vacuum and you would have significant input.

Bradley:

Yes, I would make an initial recommendation and then it would be up to my management to change it or accept it.

Hopkins:

Let's have one final question then we will. . .

Unfried:

Have we been able to establish that we are going to do something besides run out and dig up dirt. Are we going to take an environmental study, are we going to look at people, look at the EP levels, look at the blood levels, are we going to do something before we do a drastic manuever. It seems, the way you are talking that the decision has already been made, yet you say it hasn't.

Bradley:

No, no, it hasn't been made.

Unfried:

But your speaking in those terms, I want to know, did our discussion set up the situation where rather than anticipate the dirt being dug up, rather than anticipate the property values doing whatever they may do, that perhaps we will see blood tests, studies, before a decision to dig it up and carry it away.

Bradley:

Again, I have to wait for all the comments. There may be a significant number that would go against that, I don't know.

Unfried:

Did our discussion tonight lend any information that might help set that into motion.

Bradley:

Well yes, however, again there are some people here that didn't speak and it would be very helpful if you could make a concrete recommendation, say we like "H", or we like "A", we like "D", but we don't like this part of it, I don't like that, that would be very helpful because a lot of times we get comments that they really don't give us a direction, just sort of out there like I don't like any of these, that doesn't say what they do like, it just says I don't like any of these.

Kittle:

Shut down Taracorp, dig out the pile and take it to a hazzardous waste and. . .

Bradley:

That's the kind of recommendation that's. . . .that's why. .

Participant:

Why won't they move the whole pile.

Bradley:

Like I said, we have nine criteria, one of them is short term impact and this will prove itself out if it ever were to be done. The soils are a lot easier to wet especially if you're just chopping off 6 inches. a lot easier to wet, maintain and manager. that pile is a mixture of all kinds of things, big chunks of slag, little pieces of broken plastic, dust in there. Wetting that down and taking that whole thing off which is 3½

acres, 85,000 cubic yards of God knows what at the bottom even, that is a nightmare. You can throw water at it, you may not wet some of it, a piece of plastic may keep it from getting what's underneath it, soils a lot easier. That's one of the things, its a nightmare to move that. That would be something that would be extremely hard to manage. There's another consideration, again its from a safety point, the truck for example to Fort Wayne is running a tremendous risk of transportation accidents and its also burning up a lot of fuel which is going to create its own emissions too. Lastly, its an excessive costs. It represents an extreme, it represents something that removes it from your sight and takes care of the problem in one sense, but just moves it somewhere else, takes it out of your sight, costs a lot and would be a tremendous problem in digging up the pile. that's why we didn't select that. That's why, well it may not be the exact reasons, but some of the reasons that NL Industries doesn't like that either.

Kittle:

Too expensive.

Bradley:

That would tend. . .they would tend to put that one factor maybe a little higher than we would, but they also agreed that you don't want to dig it up, don't want to send it a couple hundred miles away, because guess whose liable.

Kittle:

They are.

Bradley:

Yeah.

Participant:

Maybe Indiana doesn't want it either.

Bradley:

They'll take it.

Participant:

(Inaudible) . . .why wasn't there a survey done on each of the homes in the area.

Bradley:

That accurate would just take manpower we don't have. We can't. .

Participant:

(inaudible)

Bradley:

Well, what we did, we came by and put, rolled up some flyers, put them on each door in this area and we gave everyone the chance to come to a public meeting. Thats the way we do it. Anything else would be a tremendous effort.

Kittle:

How come you put "H" first instead of, you know, A, B, C, D and how come you put it in my door at 11:30 for me to be at a meeting at 1:30 in our neighborhood and everyone that works, they wouldn't have gotten the flyers until they got home from work at 5 or 6 o'clock. I just happended to be around the house when I saw you at my door and you handed it to me, you know.

Bradley:

OK, while as far as. . . we had quite a few and the early ones were warned I would say fairly well in advance, then as we got toward the end ones, we. . .physically stuffing the boxes took a little longer than we thought and we didn't give the kind of notice that we would have liked to have given, but we also. . I hope everyone caught this, if someone missed the session that we recommended, they were to come to a later session.

Henke:

I got my flyer a week in advance.

Hopkins:

Yeah, me too.

Henke:

John, is this a meeting of the D.N.R.S.

Hopkins:

Yes.

Henke:

Is it officially convened and is a motion in order.

Hopkins:

Well, a motion will be in order, but I'm not the president anymore. I've been dethroned.

Henke:

I understand that.

Hopkins:

There was a coo, so I'm out. If there are any other questions.

Nonn:

Is there an alternative where we cover up the pile and leave everybody alone.

Hopkins:

Yes

Bradley:

Yes, there is. Alternative B is the closest to that that we have, very close to that.

Unfried:

What makes it close and not right on.

Bradley:

Well because they wouldn't just leave your yard alone, there would be some soil placed over your yard or asphalt placed over a driveway to contain the lead as opposed to picking it up. One example I can give you as far as property values go is that at the La Salle Utility Site, after the clean up, the property values went up.

Unfried:

Went up.

Bradley:

Yeah, there was a certain percentage. . .

Unfried:

What I'm asking, prior to the clean up.

Bradley:

Right.

Unfried:

Went down after you made the reference.

Bradley:

"Well, I don't know. . .

Unfried:

(Inaudible) all relative now.

Hopkins:

We got any other questions here before we. . .I would like to make one final comment on the record if I could please. I appreciate you coming down Brad after your hearing last night, it went to 11:30 I know and I appreciate your coming Mr. Webb. I hope that you understand that the people in this room, the people who's yards, back and front that you propose to dig up, these are the people that live primarily east of Niedringhaus on the map and that the people in this area have spent the last 10 years fixing up their homes in the historical area, fixing up homes that go back to the turn of the century. If you do this, if you dig up the front and back yards, it will be 10 years before this area recovers. You can talk all you want about the PCB situation up at La Salle, we're talking lead, quite a bit different. If you think that the home values in this are will recover within 10

years, I think you're badly mistaken. The media situation will be that if the proposal goes around the site itself to be one thing, there will be one media coverage for that and people can live with that because its part of the bargain that we have in having a home in the downtown area close to the industry. Its part of the bargain that we have. There are 1,400 homes, whatever it is that the front and back yards are dug up, you'll have a circus with the television cameras, the press and this will be known as Times Beach East and you won't be able to give away a house. the point that was brought up by Tim Elliot is the best point of all. There is no scientific evidenice whatsoever to substantiate the lead contamination. I'll make one final comment. Granite City is crawling with lawyers who make their living, partner, suing corporations for personal injuries for people who have effects from hazzardous waste and whatever. If there was an area where there was a contentration of people with liver disease, kidney disease, mental retardation, or any of the other effects of lead poisoning, you could bet there would be tons of lawsuits.

Henke:

Believe it, John's been looking.

Hopkins:

John's been looking, I know because I'm one of these guys and there hasn't been narily a one. The point is this, maybe there's enough evidence to satisfy the EPA but there certainly isn't enough evidence to hold up in a court of law.

The proposal that Brett made is exactly right, the EPA should re-think this as far as going into the residential areas. Our concerns are much different that the people in Eagle Park Acres, they got one concern where the alleys were lined, we got a different concern all together. I think that the best proposal is to simply leave the residential areas alone. One of the

oldest sayings in the world is, if it ain't broke, don't fix it. Maybe second only to the cure is worse than the disease and that's what I think we have here. I think that the concensus of the group is we ask you to re-think the position and take a look at it with a critical eye and realize the human costs that will be involved. The fortunes of these people, myself included, are all sunk in our homes. We have spent hundred and hundreds, literally hundreds of man hours fixing up our homes, homes that people wouldn't come into ten years ago on a bet. We fixed up these homes and now we are going to see our investment ruined because of something on a speculative might-be contamination. I think the only fair thing for all of us is to document, by additional blood test study. We are taking you at your word that the decision hasn't been made. There are cynical people in Granite City, the Mayor included as you read in the paper, who said that all of these public hearings are window dressing required by statute and that the decision has already been made. We are taking you at your word that it hasn't and you should. . you've met the people whose yards you are going to dig up. You've met the people who have spent their times fixing up their homes and you understand the impact its going to have and I hope you take it back with you.

Bradley:

I assure you that I will do that. I know there have been other Superfund Sites where there has been a strong sentiment one way and its against what has been recommended and go ahead an implement what we recommend anyway, but that's really not the way its supposed to work.

Hopkins:

I know its not the way its supposed to work.

Kittle:

You could dig up my yard in the front and back, I'd rather not have that contamination for my grandson to play in.

Bradley:

That's not going to be the case here. The purpose for me to be here is not because the law requires it or actually to be there last night.

Hopkins:

I understand that.

Bradyley:

I hope my coming here tonight indicates to you that I'm interested here and again I just recommend, made a concrete statement.

Hopkins:

OK

Bradley:

Make it clear, give us a specific direction. If you're vague, it doesn't help. Then we just look at it and say, well what do they mean. Also, please consider what happens if we don't clean it up. You would have data on record of certain levels that may be a health hazzard. Consider it, that's all I'm asking.

Participant:

But even if they don't dig up the yards, they are still going to put a cap on this pile.

Bradley:

That would be the alternative. You need to take a good read through of the alternatives. You're see that these are close to what you are saying.

Hopkins:

Any comments or other questions. I would like to again personally thank Mr. Webb and Mr. Bradley and I think they deserve a round of applause. As I pointed out this was above and beyond his duty. His obligation was to come last night and he is here tonight of his own accord.

Transcribed: February 21st & 22nd, 1990

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March 12, 1990

Ms. Mary Ann Croce LaFaire
Community Relations Coordinator
U.S. EPA (5PA-14)
230 South Dearborn Street
Chicago, IL 60604

RE: NL Industries/Taracorp Site-Comments of St. Louis Lead Recyclers ("SLLR") to Draft Feasibility Study and Proposed Plan

Dear Ms. LaFaire:

We have reviewed the Draft Feasibility Study for the Taracorp Site in Granite City, Illinois, dated August 1989, the Addendum to the Draft Feasibility Study Report, dated January 10, 1990, the U.S. EPA's Proposal Plan for the NL Industries/Taracorp Site, Granite City, Illinois, dated January 10, 1990. SLLR would like to comment on several errors contained in these documents. Our comments are enclosed as Attachment A. Please include these comments in the Administrative Record.

Should you have any questions or require further information, please do not hesitate to contact me.

Very truly yours,

DAMES & MOORE
A Professional Limited Partnership

Neil J. Jost, P.E.
Associate

njj/ket
Enclosure
cc: Steven McAllister, Galena Industries
Jim Stack, Galena Industries
George von Stamwitz, Esq.
Donald J. Harvey, Dames & Moore

ATTACHMENT A

St. Louis Lead Recyclers
Comments on Documents
Related to NL Industries/
Taracorp Site, Granite City, Illinois

U.S. EPA Proposed Plan

1. Page 2, Paragraph 2, Sentences 1 and 3

Although St. Louis Lead Recyclers (SLLR) leased the building from Trust 454 and begin installing equipment in August, 1980, and accepted limited quantities of waste pile material starting in July 1981 for process development purposes, SLLR did not start full-scale recycling of lead waste from the Taracorp pile until April, 1982; SLLR shut down all operations due to a contractual dispute with Taracorp on March 21, 1983.

2. Page 3, Paragraph 3, Sentences 3 and 4

The volumes and lead content of the piles on Trust 454 property are incorrect. A recent survey conducted for SLLR by SMS Engineers (See Exhibit 1) found that there are 3,640 cubic yards of rubber chips and 416 cubic yards of slag and mattes on Trust 454 property. Samples of the rubber chips, slags, and matte were analyzed for EP Toxic and total metals. In addition, a sample of each material was analyzed for the TCCP list of parameters, reactivity, and corrosivity. The total lead content of the battery chips varied from one percent to four percent. The slag and matte continued from four to fifteen percent and 0.3 to 0.35 percent respectively (see Exhibit 2, Table 1 for a summary of the analytical results). The lead content in these results are an order of magnitude lower than the results reported in the Proposed Plan as well as the RI and FS reports.

3. Page 3, Paragraph 5, Sentences 3 and 5

Same as comment number 2. In addition, the unpaved area is reported as having a surface lead concentration of 9,250 mg/kg. This is a misleading statement implying that the lead content of surface soil throughout the Trust 454 property is 9,250 mg/kg. However, since the soil sample that contained that high concentration was collected near the edge of rubber chip pile 3, it should not be used to reflect the lead content of Trust 454 surface soil as a whole. As our sampling results indicate the lead content of the surface soils on Trust 454 property (SS-1 through SS-4) (See Exhibits 2, Tables 1 and 2) varies from about 1,000 ppm in the southeast corner of the site to 9,340 ppm near the rubber chip pile. In addition, the

found to increase and decrease with depth (See Exhibit 2, Table 3). Four excavations (EX-1 through EX-4) were sampled on Trust 454 property. One of these excavations revealed an 18-inch thick layer of broken battery casing and slag material. Also, the results indicate that although the lead content tends to vary with depth and some increase with depth is observed, it rapidly and uniformly falls to low levels as a clay layer is encountered at about one to two feet depth (See Exhibit 3). This initial increase in lead content could reflect historic waste disposal by previous occupants as the layer of broken battery casings found in EX-1 seems to indicate.

Feasibility Study Report

5. Page 5, Section I.3.3, Paragraph 2, Sentences 2 and 3

See Comment #3.

6. Page 6, Section 1.3.3, Paragraph 1, Sentence 1

See Comment #3.

7. Page 6, Section 1.3.3, Paragraph 1, Sentence 4

The Consent Decree signed by IEPA and SLLR required a number of actions by SLLR to control fugitive dust (including paving) upon recommencement of any lead waste recycling activity. SLLR applied asphalt material to the gravel road in compliance with the Consent Decree. However, since SLLR has not recycled any lead waste since March 1983, the asphalt has not been reapplied.

Exhibit, Page 5-30, Section 5.9, Paragraph 2, Sentence 2

See Comment #2 regarding lead content of the ebonite (rubber chips).

Exhibit 1

Site Topographic Map

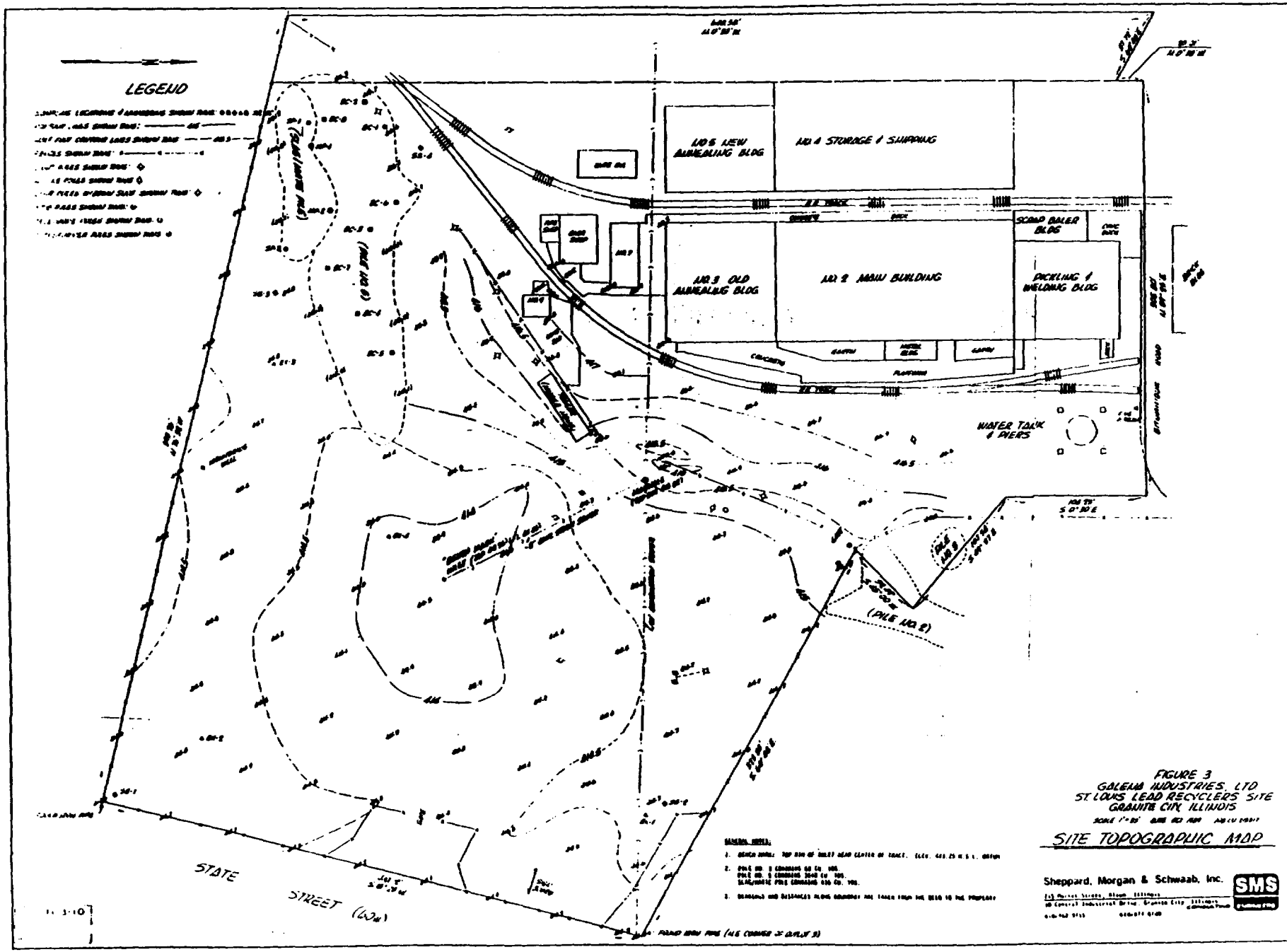


FIGURE 3
GALEAM INDUSTRIES, LTD.
ST. LOUIS LEAD RECYCLERS SITE
GRANITE CITY, ILLINOIS

SITE TOPOGRAPHIC MAP

Sheppard, Morgan & Schwaab, Inc.

Exhibit 2

Summary of Soil and Wastepile Analyses

TABLE 1
WASTE PILE AND SOIL CHARACTERIZATION DATA - INORGANIC ANALYSES @(MG/KG)

Parameter	SS-1 (5799)	SS-1 SUB (5800)	SS-2 (5801)	SS-2 SUB (5802)	SS-3 (5803)	SS-3 SUB (5804)	SS-4 (5805)	SS-4 SUB (5806)	NP-1 (5807)	NP-2 (5808)	SP-1 (5809)	SP-2 (5810)
Ag	<0.79	<0.77	<0.82	<0.86	<0.79	<0.81 (0.106)	<0.81	<0.76	<0.73	<0.75	<0.83	1.69
As	40.8	61.2	34.3	12.5	28.2	41.0 (33.5)	219.2	346.4	<0.48	1.12	3767	2655
Ba	96.1	22.1	391.0	72.8	366.0	1890 (1660)	119	533	472	368	270	559
Cd	3.7	0.29	3.0	5.0	2.7	20.2 (35.3)	5.3	7.1	54.4	17.2	223	8.8
Cr	21.5	3.7	103	11.4	18.1	2350 (359)	28.8	39.8	56.1	79.8	56.1	79.8
Hg	0.13	<0.10 (<0.10)	<0.10	0.14	<0.10	35.7	0.85	1.38	<0.10	<0.10 (<0.10)	0.12	<0.10
Pb	1660	57.5	3140	28,100	1070	11,200 (13,900)	9560	16,700	2950	3460	149,000	63,800
Se	0.60	0.53	1.62	--	3.66	<0.51 (<0.52)	0.89	--	--	--	3.02	42.6
Ag (EP)	<0.050 (<0.050)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
As (EP)	<0.200 (<0.200)	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200
Ba (EP)	0.701 (0.693)	<0.250	0.700	0.335	0.760	1.09	0.270	0.282	0.567	0.856	<0.250	<0.250
Cd (EP)	<0.020 (<0.020)	<0.020	0.024	0.020	<0.020	0.211	0.022	0.024	0.035	0.057	0.770	0.062
Cr (EP)	<0.001 (<0.001)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

TABLE 1 (CONTINUED)
WASTE PILE AND SOIL CHARACTERIZATION DATA - INORGANIC ANALYSES @(MG/KG)

Parameter	BC-1 (5811)	BC-2 (5812)	BC-3 (5813)	BC-4 (5814)	BC-5 (5815)	BC-6 (5816)	BC-7 (5817)	BC-8 (5818)
Ag	<0.85	1.04	<0.75	0.92	<0.85	<0.85	<0.85	<0.70
As	798.7	398.2	252.3	724.4	250.4	280.4 (33.5)	178.0	143.4
Ba	73.7	189	134	75.8	70.9	66.8	161	88.1
Cd	1.5	1.2	3.1	7.2	1.6	2.4	4.1	2.1
Cr	5.8	8.0	8.2	8.8	10.2	5.6	33.0	7.4
Hg	0.21	0.25	0.38	0.65	3.95	0.22	0.26	0.18
Pb	22,600	10,600	21,900	42,700	24,200	32,100	27,900	14,600
Se	<2.72	2.65	3.13	<1.93	3.30	<2.72	<2.72	<2.22
Ag (EP)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
As (EP)	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200
Bs (EP)	<0.250	<0.250	<0.250	<0.250	<0.250	<0.250	<0.250	<0.200
Cd (EP)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cr (EP)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Hg (EP)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Pb (EP)	70.60	49.50	0.942	46.30	28.60	123.00	76.60	27.2
Se (EP)	0.221	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200
Corrosivity	NR	NR	6.48	NR	NR	NR	NR	NR
Reactivity - CN	NR	NR	NEG	NR	NR	NR	NR	NR

TABLE 1 (CONTINUED)
WASTE PILE CHARACTERIZATION DATA - INORGANIC ANALYSES a(MG/KG)

Parameter	BC-1 (5811)	BC-2 (5812)	BC-3 (5813)	BC-4 (5814)	BC-5 (5815)	BC-6 (5816)	BC-7 (5817)	BC-8 (5818)
Reactivity -	NR	NR	NEG	NR	NR	NR	NR	NR
Ag (TCLP)	NR	NR	<0.050	NR	NR	NR	NR	NR
As (TCLP)	NR	NR	<0.027	NR	NR	NR	NR	NR
Ba (TCLP)	NR	NR	<0.361	NR	NR	NR	NR	NR
Cd (TCLP)	NR	NR	<0.020	NR	NR	NR	NR	NR
Cr (TCLP)	NR	NR	<0.010	NR	NR	NR	NR	NR
Hg (TCLP)	NR	NR	<0.0002 (<0.0002)	NR	NR	NR	NR	NR
Pb (TCLP)	NR	NR	L73	NR	NR	NR	NR	NR
Se (TCLP)	NR	NR	<0.200	NR	NR	NR	NR	NR

TABLE 1 (CONTINUED)

WASTE PILE AND SOIL CHARACTERIZATION DATA - INORGANIC ANALYSES a(MG/KG)

·arameter	SS-1 (5799)	SS-1 SUB (5800)	SS-2 (5801)	SS-2 SUB (5802)	SS-3 (5803)	SS-3 SUB (5804)	SS-4 (5805)	SS-4 SUB (5806)	MP-1 (5807)	MP-2 (5808)	SP-1 (5809)	SP-2 (5810)
Hg (EP)	<0.0002	<0.0002 (<0.0002)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Pb (EP)	0.412 (0.418)	<0.066	9.150	74.00	2.470	13.40	1.110	1.110	0.449	1.630	1,192.0	378.0
Se (EP)	<0.200 (<0.200)	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200
Corrosivity	NR	NR	NR	NR	NR	NR	NR	7.00	9.53 (4.50)	9.46	6.75	NR
Reactivity - Cn	NR	NR	NR	NR	NR	NR	NR	NEG	NEG	NR	NEG	NR
Reactivity-S	NR	NR	NR	NR	NR	NR	NR	NEG (NEG)	NEG	NR	NEG	NR
Ag (TCLP)	NR	NR	NR	NR	NR	NR	NR	NR	<0.050 (<0.050)	NR	<0.050 0.329	NR
As (TCLP)	NR	NR	NR	NR	NR	NR	NR	NR	<0.200 (<0.200)	NR	<0.050 0.329	NR
Ba (TCLP)	NR	NR	NR	NR	NR	NR	NR	NR	<0.250 (<0.250)	NR	<0.7746	NR
Cd (TCLP)	NR	NR	NR	NR	NR	NR	NR	NR	<0.020 (<0.020)	NR	<0.020	NR
Cr (TCLP)	NR	NR	NR	NR	NR	NR	NR	NR	<0.100 (<0.100)	NR	<0.100	NR
lg (TCLP)	NR	NR	NR	NR	NR	NR	NR	NR	<0.0002	NR	<0.0002	NR
· (TCLP)	NR	NR	NR	NR	NR	NR	NR	NR	<0.100 (<0.100)	NR	980	NR
(TCLP)	NR	NR	NR	NR	NR	NR	NR	NR	<0.200 (<0.201	NR	<0.200	NR

s: EP = EP toxicity extraction; TCLP = TCLP extraction. ( ) = duplicate

TABLE 2

,S - WASTE PILE CHARACTERIZATION (TCLP)

RGA	Sample Concentration (PPB) MP-1 (5807)	SP-1 (5809)	BC-3 (5813)
Is	<0.17	<0.17	<0.17
1	<0.043	<0.043	<0.043
ropr id Si..	<0.003	<0.003	<0.003
S	<0.028	<0.028	<0.028
	<0.153	2.9	<0.153
	<0.357	<0.357	<0.357
	<0.071	<0.071	<0.071
Cur..	0.025	0.008	0.013
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND
	ND	ND	ND

using TCLP protocol due to significant interferences.
uliations are reported on EP Toxicity extractions.

Herb
hard

ND =

TABLE 2

ORGANIC RESULTS - WASTE CHARACTERIZATION (TCLP)
(continued)

Parameter	Sample Concentration (PPB) MP-1 (5807)	SP-1 (5809)	BC-3 (5813)
Volatile Compounds			
Acrylonitrile	ND	ND	ND
Benzene	ND	10.85	ND
Carbon Disulfide	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND
Chlorobenzene	ND	ND	ND
Chloroform	ND	4.21	ND
1,2-Dichloroethane	ND	ND	ND
1,1-Dichloroethylene	ND	ND	ND
Isobutanol	ND	ND	ND
Methylene Chloride	12.74	14.93	3.49
Methyl ethyl ketone	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND
Tetrachloroethylene	1.93	5.55	ND
Toluene	25.47	55.94	4.42
1,1,1-Trichloroethane	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND
Trichloroethylene	ND	3.93	ND
Vinyl Chloride	ND	ND	ND

NOTE:

ND = Not Detected

TABLE 3

SUMMARY OF EXCAVATION ANALYTICAL RESULTS

Site Identification	Depth of Sample	Total Lead Concentration (mg/kg)[1]
EX1	0"	3,310
EX1	18"	57,400
EX1	24"	701
EX1	36"	1,660
EX2	0"	988
EX2	12"	<11.4
EX2	18"	50.9
EX3	0"	8,880
EX3	12"	15,000
EX3	18"	<17.2
EX4	0"	2,200 (1,750)
EX4	12"	1,220
EX4	18"	11.9

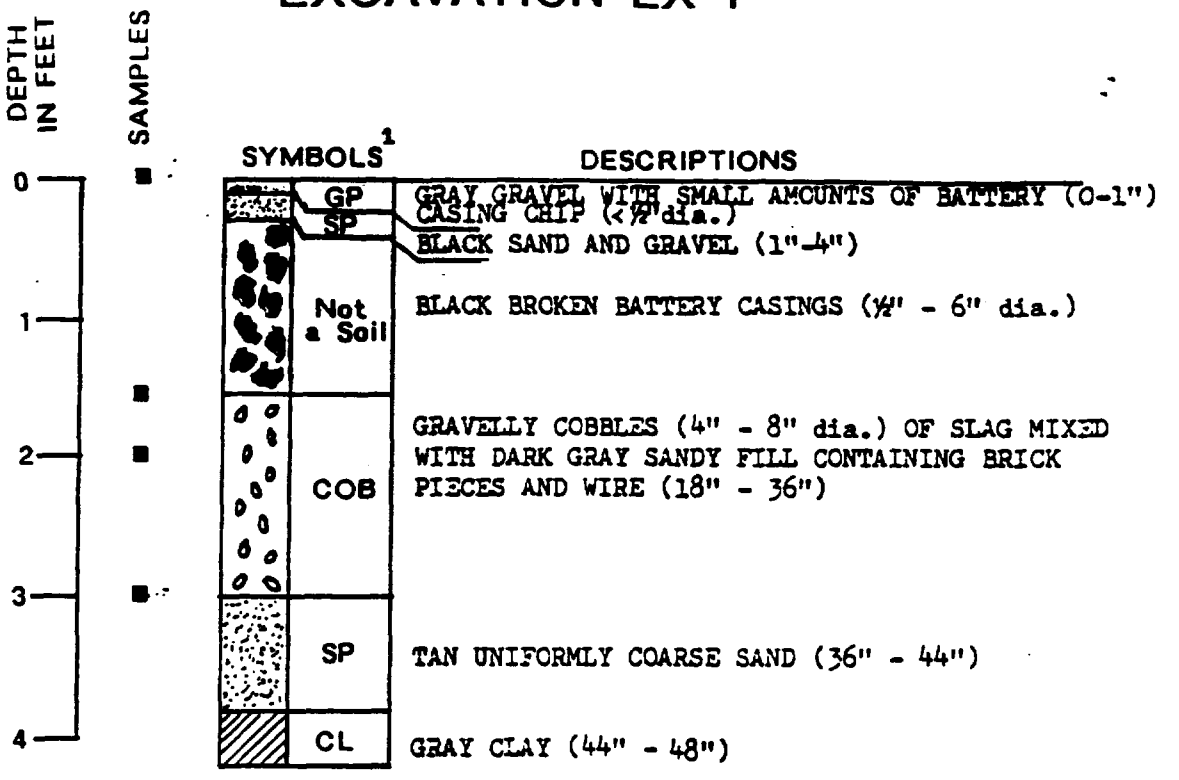
Notes:

[1]mg/kg = ppm
( ) = duplicate

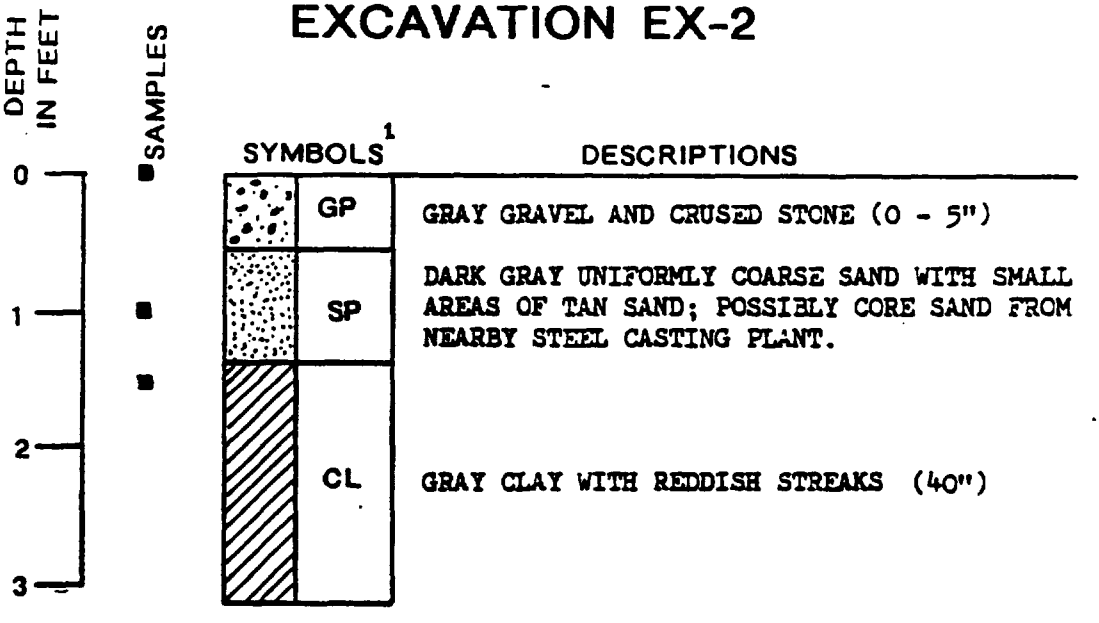
Exhibit 3

Excavation Logs

EXCAVATION EX-1



EXCAVATION EX-2



[1] United Soil Classification System

■ Samples collected with clean trowels from face of excavation.

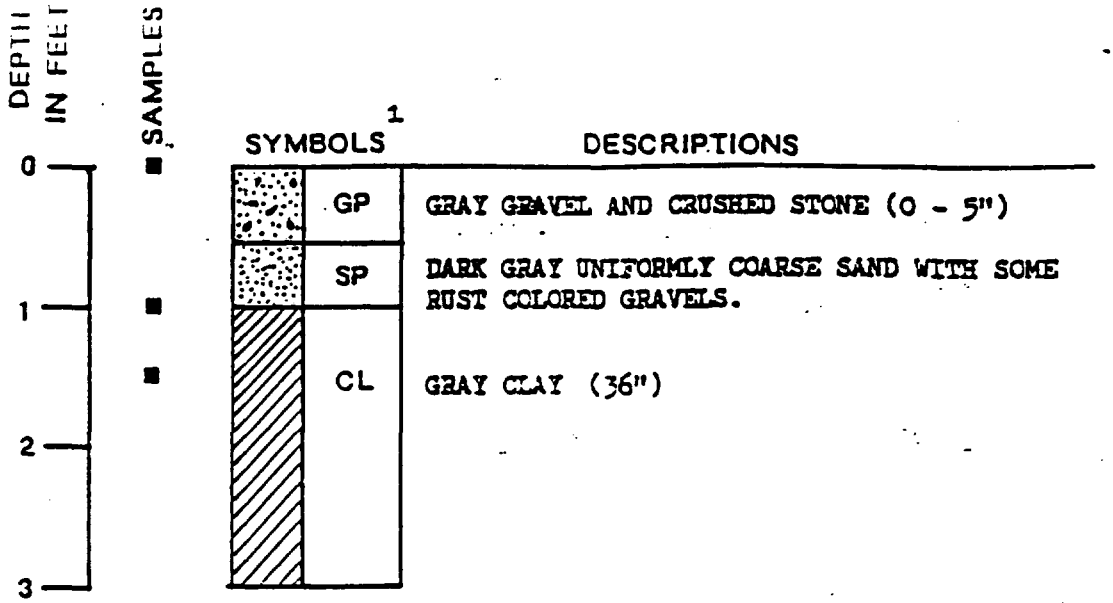
FIGURE 1A

EXCAVATION LOGS

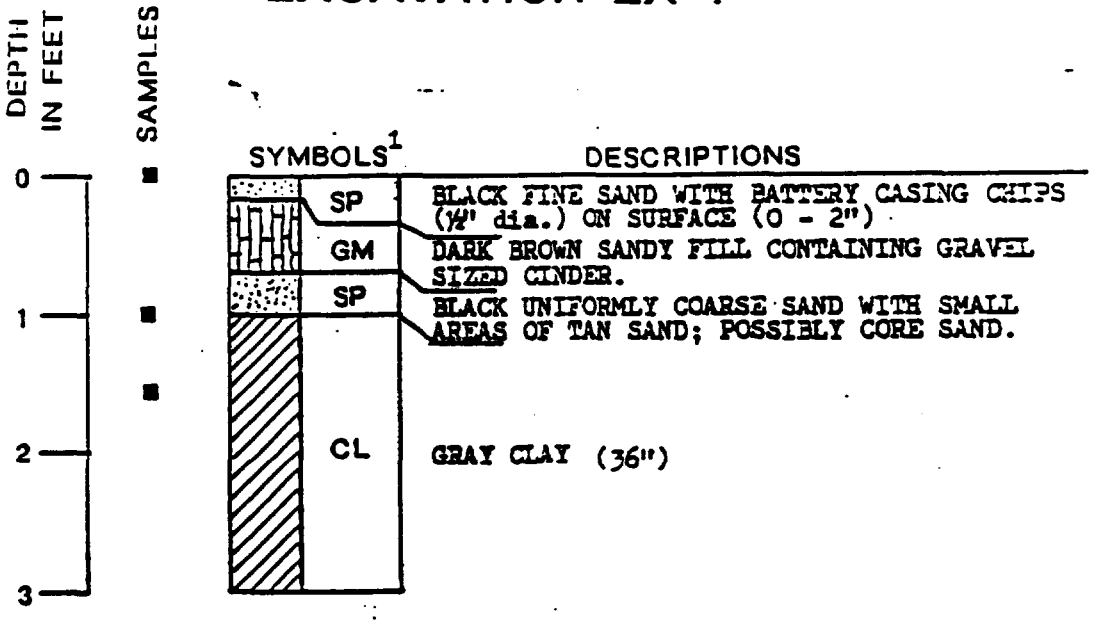
ST. LOUIS LEAD RECYCLERS

Granite City, Illinois

Dames & Moore



EXCAVATION EX-4



[1] United Soil Classification System

■ Samples collected with clean trowels from face of excavation.

FIGURE 1B

EXCAVATION LOGS

ST. LOUIS LEAD RECYCLERS
Granite City, Illinois

Dames & Moore

Environmental and Safety Engineering Staff
Ford Motor Company

Suite 608
15201 Century Drive
Dearborn, Michigan 48120

March 12, 1990

Mary Ann Croce LaFaire (5PA-14)
Office of Public Affairs
U.S. Environmental Protection Agency Region V
230 South Dearborn
Chicago, Illinois 60604

Subject: Comments to NL/Taracorp Superfund Site Cleanup Actions

Ms. LaFaire:

Ford Motor Company has had the opportunity to review the O'Brien & Gere Draft Report "Feasibility Study Taracorp Site - Granite City, Illinois", dated August 1989, and requests that our comments be included for U.S. EPA review prior to selection of a final cleanup remedy.

A site specific risk-based approach to a cleanup standard is most appropriate and the mere presence of lead in the soil should not warrant excessive remediation. Recognition of both a pathway and a receptor for the contaminant (i.e., lead) should be the foremost concern when affording protection to human health and the environment.

Off-site installation of an asphalt or topsoil/sod cover will provide this level of protection by eliminating direct contact and fugitive emissions to surrounding residential, commercial and industrial areas. U.S. EPA recognizes paving as a viable means to remediating unpaved areas containing significant lead concentrations (e.g., 4000 - 9250 mg/kg) as demonstrated by the signing of two Consent Orders (one by Tri City Trucking and one by St. Louis Lead Recyclers, Trust 454 and Stackorp) in 1984. A cover consisting of three inches of topsoil plus sod will provide similar protection to residential areas not subject to paving.

Off-site airborne migration of lead residues and direct soil contact appear to be the only viable pathways for contaminant transport. Every consideration should be given to eliminating off-site excavation of soils whenever paving or sodding is possible. Because the NL/Taracorp site is restricted by the volume of waste it can contain for on-site closure (due to

property lines and flood plain boundaries) and the likelihood that air Applicable or Relevant and Appropriate Requirements may not be satisfied during bulk excavation, U.S. EPA's Preferred Alternative H does not appear to be most protective of both human health and the environment.

Should you have any questions, please contact David O'Connor of this Office at 313/322-0701.

Sincerely,

David G. O'Connor for,

Jerome S. Amber
Principal Staff Engineer
Stationary Source Environmental
Control Office

2/12/90

2929 National Ave.
Granite City, IL
62040

U.S Environmental Protection Agency
Office of Public Affairs
Region 5
230 S. Dearborn St.
Chicago, IL 60604

To whom it may Concern:

In regard to the EPA's proposal to make Tapacorp in Granite City a permanent waste site.

Isn't Granite polluted enough? Everyone thinks of Granite as a dirty steel mill town and therefore figure a little more pollution couldn't hurt. But it has hurt. Most of our Children have lung problems, including my own. Most of my friends parents have died of cancer. (My own mother was recently diagnosed with cancer.) When do we start looking

for <u>real</u> solutions? These BULLSHIT solutions don't solve the <u>real</u> problem. A proposal that suggest we collect all the hazardous materials, put them in a big pile, cap them and monitor them, is BULLSHIT!

The United States is one of the most advanced countries in the world. You would think we could solve our pollution problems. But I understand why we haven't. It's more profitable to exhaust all of our natural resources, exploit our land, water and wildlife. And its more expensive to use the best method of waste management - recycling. The rich don't suffer (Big Business). They can afford to buy spring water and organic grown food. The poor and middle class <u>always</u> pay the price.

Let me ask you this. Do we really have any options? Do

you really want to hear our opinions? Or are you just taking the necessary steps before you make <u>your</u> decision?

Sincerely,
Helen Ramos

Granite City Board of Realtors

Granite City, Illinois

REALTOR®

A Corporation Organized to Support Right Principles and Oppose Bad Practices in THE PROFESSION OF REAL ESTATE. ITS MEMBERS AFFILIATED WITH THE NATIONAL ASSOCIATION OF REAL ESTATE BOARDS AND THEREBY ENTITLED TO USE THE DESIGNATION "REALTOR"

Taracorp Cleanup
℅ Mary Ann LaFaire
Community Realtions
U.S.E.P.A. (SPA - 14)
230 S. Dearborn
Chicago, Illinois 60604

Dear Ms. LaFaire;

Enclosed is the statement of the Granite City Board of Realtors concerning the cleanup of the Taracorp/National Lead site in Granite City, Illinois. It is our desire that the statement be included as testimony to be evaluated by the EPA.

Sincerely

Harold D. Cavins
President

HDC/dim

Copy To: U.S. Senator Paul Simon
U.S. Senator Alan Dixon
State Senator Sam Valalabene
State Representative Sam Wolf
U. S. Representative Jerry Costello
Mayor Von Dee Cruse

REALTOR®

Granite City Board of Realtors

Granite City, Illinois

STATEMENT OF THE GRANITE CITY BOARD OF REALTORS IN REGARD TO TARACORP CLEANUP

In regards to the Taracorp Cleanup program being studied by the EPA in Granite City, Illinois at the present time, the Granite City Board of Realtors take exception to some of the statements released by the EPA representatives and feel that additional studies are needed in order to proceed in a rational series of events.

First, the EPA chose to use a very stringent defination of "a significant health hazard" and randomly chose 500 parts per million as a standard for lead contamination. Since the real hazard is the accumulation of lead in the human body, the Granite City Board of Realtors feel that funds should be made available for blood testing and that blood tests should be taken in the area suspected by the EPA to be lead contaminated. It was brought to our attention at a recent EPA/Public meeting that blood testing had not been conducted.

In 1982, a blood sampling was conducted by the Illinois EPA and at that time the EPA chose to ignore the findings that the residents did not have elevated levels of lead in the blood stream. Since the ultimate health hazard is the level of lead in the blood stream, sampling of the blood should be made before any further action is taken by the EPA. If in fact the 1982 report by the Illinois EPA was correct and is still correct then a health hazard as described by the EPA does not exit.

The EPA in issuing their statement of possible contamination in the 55 block area surrounding Taracorp has caused economic damage upon the property owners and the city in general. The EPA without complete and accurate, let alone current tests has acted prematurely by issuing a potential health hazard. The EPA has created havoc in the present selling and future selling of property owned by the citizens in the "alledged" area of contamination. Any real estate company offering property for sale or rent in the area designated by the EPA as having "Possible Contamination" would have to give full disclosure to the renter or buyer of the "Possible" contamination by lead.

The area within a one mile radius of the Taracorp property has been stigmatized and in all probability made unsaleable. Simple cleanup of this immediate area would not by itself remedy the situation.

The Granite City Board of Realtors with all of the above statements in mind have reached the following conclusions:

1. The EPA has not conducted a current, complete study on the designated area and should so inform the public.

2. That all action on the Taracorp Cleanup proposals be put on hold until tests for blood levels of lead have been conducted on the residents of the designated area.

3. That EPA's action has been an action of mediation between Taracorp, National Lead and other parties and that the EPA has not fully established positive proof of contamination of ALL of the affected area as announced.

4. That the EPA has caused severe economic problems for land owners and the City of Granite City, Illinois through inadequate studies and their release of these partial studies to the general public.

5. Commercial and residential growth of the City has been greatly damaged by the actions of the EPA and will continue as such for many years.

6. Most important is that EPA has not given any positive proof of any damage to health by lead to any resident of the designated area.

Therefore the Granite City Board of Realtors recommend that all decisions made by the EPA in regards to the TARACORP CLEANUP be put on hold until adequate, complete scientific studies of possible lead contamination with definite health hazards to the general population be established.

Harold D. Cavins
President,
Granite City Board of Realtors

Office of the Mayor

VON DEE CRUSE, Mayor
OFFICE: 618-452-6214

City of Granite City, Illinois 62040

February 15, 1990

Mrs. Mary Ann LaFaire
USEPA (5PA-14)
230 South Dearborn Street
Chicago, IL 60604

Re: **Comments, NL/TARACORP Superfund Site**

Dear Mrs. LaFaire:

Please consider this letter as containing my official comments regarding the subject site. These are submitted in my official capacity as Mayor of Granite City.

1. I do not support the concept of expanding the current waste pile. If this proves necessary, based on other factors, I support minimizing the size. The effect of a large pile, even if encapsulated, will be to create a stigma for Granite City being a contaminated town. The pile, even though it may pose no health risk, will serve as a perpetual reminder of the contamination. This will have a severe impact on the City's ability to develop and rehabilitate.

2. I do not believe that mere yard soil replacement will be adequate to make those property owners "whole". The problem, again, lies in the stigma associated with that action. I propose that those residences located within the 1000 ppm + area be purchased, razed and excavated. The area would then be zoned commercial thus assuring that housing would never again be allowed in that area.

3. I do not support the replacement of soil in areas where lead levels are below 1000 ppm. This is an excessive amount of soil to be added to the pile or to be hauled off. Again, a stigma would remain due to the publicity of the action. Most importantly, EPA can, as yet, offer no scientific justification for requiring this work.

4. I do support the concept of beginning work as soon as possible. This implies that the industries and EPA agree on certain actions and that work begin immediately on those items. Meanwhile, the open issues can be resolved. Early accomplishment reduces the City's exposure to the press and inhibits the

development of an adverse stigma toward the City. It also expedites the time when development can resume in the Downtown area.

5. I support the conduct of a blood lead level study which would document scientifically the need for soil removal from residential areas and to what extent. It must, necessarily consider factors like time of exposure, intensity of exposure and resultant blood lead level.

The more extensive the remediation is, the more adverse will be the effects on City image, property values and development potential. Therefore, all remediation should be designed to be low key, but environmentally sound. I do not wish to see health impaired nor do I wish to see the economic viability of the City deminished.

Sincerely,

Von Dee Cruse

Von Dee Cruse
Mayor

VDC:dls

February 19,1990

U.S. EPA (5PA-14)
230 South Dearborn Street
Chicago, Il. 60604

Re: NL/Taracorp site

Attention: MaryAnn Croce LaFaire

As a concerned citizen of Granite City and a property owner, I find only Alternate A as having any merit. The waste pile has been treated with a coherent, thus giving all parties involved a period to study again how much and if anything should be actually removed from this site or any of the surrounding areas mentioned.

I also find very inadequate the testing of actual people that has been done in this situation. The treatment of all the families with children has been rather highhanded and I think should be handled as a completely separate issue stressing education, monitoring and testing.

I side with the three mayors that further studies on all aspects of-this cleanup are needed, before any action is taken.

Sincerely, Mary Ann Lauda

2338 25
Granite City, Il
62040

February 19,1990

U.S. EPA (5PA-14)
230 South Dearborn Street
Chicago, Il. 60604

Re: NL/Taracorp site

Attention: MaryAnn Croce LaFaire

As a concerned citizen of Granite City and a property owner, I find only Alternate A as having any merit. The waste pile has been treated with a coherent, thus giving all parties involved a period to study again how much and if anything should be actually removed from this site or any of the surrounding areas mentioned.

I also find very inadequate the testing of actual people that has been done in this situation. The treatment of all the families with children has been rather highhanded and I think should be handled as a completely separate issue stressing education, monitoring and testing.

I side with the three mayors that further studies on all aspects of this cleanup are needed, before any action is taken.

Sincerely,

Margaret D Ritchie
2314 Delmar
Granite City Il 62040

February 19,1990

U.S. EPA (5PA-14)
230 South Dearborn Street
Chicago, Il. 60604

Re: NL/Taracorp site

Attention: MaryAnn Croce LaFaire

As a concerned citizen of Granite City and a property owner, I find only Alternate A as having any merit. The waste pile has been treated with a coherent, thus giving all parties involved a period to study again how much and if anything should be actually removed from this site or any of the surrounding areas mentioned.

I also find very inadequate the testing of actual people that has been done in this situation. The treatment of all the families with children has been rather highhanded and I think should be handled as a completely separate issue stressing education, monitoring and testing.

I side with the three mayors that further studies on all aspects of this cleanup are needed, before any action is taken.

Sincerely,

Mike Ritchie

3312 Adams

February 19,1990

U.S. EPA (5PA-14)
230 South Dearborn Street
Chicago, Il. 60604

Re: NL/Taracorp site

Attention: MaryAnn Croce LaFaire

As a concerned citizen of Granite City and a property owner, I find only Alternate A as having any merit. The waste pile has been treated with a coherent, thus giving all parties involved a period to study again how much and if anything should be actually removed from this site or any of the surrounding areas mentioned.

I also find very inadequate the testing of actual people that has been done in this situation. The treatment of all the families with children has been rather highhanded and I think should be handled as a completely separate issue stressing education, monitoring and testing.

I side with the three mayors that further studies on all aspects of this cleanup are needed, before any action is taken.

Sincerely,

Ms. MaryAnn Croce Lafaire
US EPA (5PA-14)
230 South Dearborn Street
Chicago, IL 60604

Dear Ms. Lafaire:

I recently received information regarding the cleanup proposal at the NL/Taracorp site in Madison County. I live a 722 State Street in Madison, Illinois. I do not know the lead levels on my property, but I believe it is high, as my house is in area #3 or #4 of the site area. The EPA's preferred alternative is fine with me if all properties are checked and the residents and owners are made aware of the concentrations of lead on the property. I would like to receive information about the cleanup by being placed on your mailing list. Thank you.

Mr. William C. Davis
722 State Street
Madison, IL 62060

February 24, 1990

To Mary Ann Croce Lafaire:

My name is David McMillen, I attended the township hall public meeting on February 8, 1990.

I heard and studied the clean up choices by the U.S. E.P.A. I feel the best alternative will be Plan G, take the hazardous waste to an E.P.A. approved land fill.

The site location is an area already struggling for new business development and what alot of people feel is a dying part of Granite City. I feel without removing the hazardous waste completely, it will hurt future development in this area such as new businesses, homes, parks, restaurants, etc.

My understanding is that there is consideration for Alternative D. No one can reassure ground shifting waste, earth tremors, natural soil being absorbed by this hazardous waste will not contaminate ground water in the future. To me we're just bearing a future problem.

Let's be realistic, would you move next to a hazardous waste "CAPPED-dump."

If you would like to take to me, please send a letter.

Please do what's best for us, our children and our future children.

Thankyou
David McMillen
2533 Angela
Granite City, IL 62040

A concerened Granite City Resident

1-29-30

MARY ANN CROCE LAFAIRE
U.S. EPA (5PA-14)
230 SOUTH DEARBORN STREET
CHICAGO, IL 60604

DEAR LADY LAFAIRE:

I HAVE EXAMINED ALL THE ALTERNATIVES PROPOSED FOR THE NL INDUSTRIES - TARACORP LEAD SMELTER SUPERFUND SITE. I HAVE WEIGHED THE TRADE-OFF BETWEEN THE HEALTH OF THE PEOPLE IN THIS CITY AGAINST MONETARY COSTS AND I MUST NOT ALLOW COSTS TO BLIND ME TO THE SERIOUSNESS OF LEAD CONTAMINATIONS IN OUR CITIZEN'S MORAL BODIES. I HAVE CHOSEN ALTERNATIVE "G" AS THE BEST CHOICE.

THANK YOU,
WILLIAM A. DALTON
2036 WASHINGTON AVE.
GRANITE CITY, IL 62040-5326
(618) 877-7591

* THIS SHOULD SERVE AS AN EXAMPLE OF THE SERIOUSNESS OF POLLUTING OUR PLANET! OUR CHILDREN ARE OUR MOST IMPORTANT RESOURCE! WE CAN NOT AFFORD TO DESTROY OUR NATURAL ENVIRONMENT!

2153 Cleveland Blvd.
Granite City, IL 62040
February 10, 1990

Mary Ann Croce LaFaire
U.S. EPA's Community Relations Coordinator
U.S. EPA (5PA-14)
230 South Dearborn Street
Chicago, IL 60604

Dear Ms. Croce LaFaire,

As residents and owners of property in the NL/Taracorp Superfund Site our family would like to express our opinion about the cleanup alternatives presented.

We are not in agreement with EPA's choice of Alternative H as the preferred alternative. Initially, the decision to leave the Taracorp pile intact, with a few environmental safeguards seems illadvised. The only factor that recommends this site for permanent storage is the fact that the material is already there. The gamble that the contaminated material will not enter the ground water seems extremely risky given the low levels of pollutant necessary in water to form a serious health risk.

The primary advantage of Alternative H would seem to be cost. The costs considered however are only today's. Alternative H leaves open the possibility of serious economic losses due to the mere prescence of the pile as well as human costs in the event of future leakage or accidents. As the gamble could realistically involve the viability of this community I am unwilling to put a price on that risk.

Alternative G, on the contrary, removes the waste and offers hope for the economic and human viability of this community. Some, including EPA officials, have argued that all we would be doing is putting these toxic materials in someone else's backyard. If this be the case, what is the purpose of "an EPA-approved hazardous waste landfill"? We assume these are sites selected, constructed and monitored to allow for the reasonably safe storage/disposal of toxins such as we have. By definition they have (or should have) advantages over the current storage site. To say there is no totally safe place to store them is not equivalent to saying all locations are equally advantageous.

Myself, my parents and my grandparents have lived in the NL/Taracorp Superfund site. We would like to believe this community can survive and be a healthy community for generations to come. The only way we can insure that is to avoid cheap or incomplete solutions to this major problem. We encourage you to share our commitment to this community and choose Alternative G.

Sincerely,

Michael D. Colligan

GARDNER, CARTON & DOUGLAS

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321 NORTH CLARK STREET
CHICAGO, ILLINOIS 60610-4795
(312) 644-3000
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WRITER'S DIRECT DIAL NUMBER

BRADLEY R. O'BRIEN
(312) 245-8475

March 12, 1990

Mr. Steven Siegel
Office of Regional Counsel
United States Environmental
Protection Agency
230 South Dearborn Street
Chicago, Illinois 60604

Re: CBC Inc./Taracorp Site

Dear Mr. Siegel:

CBC Inc. hereby incorporates the public comment of NL Industries on the proposed plan for the Taracorp Superfund site located in Granite City, Illinois. CBC Inc. requests that its comment be placed in the administrative record.

Very truly yours,

Bradley R. O'Brien

BRO:pdh

0892q

BB

2/16/90

Gentlemen: Re NL/Taracorp Site

Is There The Possibility That Any or All Houses Will Be Demolished In An Effort To Clean Up The Area Outlined By The EPA Rather Than Remove 6' of Soil + Replace With Different Soil?

P.S.
I'm In Favor of The Clean Up As Outlined On 2/8/90 By Mr. Bradley

Warren J Lemmer
1704 Edison
Granite City, Ill. 62040

March 10, 1990
2901 Lincoln Ave.
Granite City, IL 62040

Mrs. Mary Ann Croce LaPaire
USEPA Co-ordinator
Office of Public Affairs
USEPA Region 5
230 S. Dearborn St.
Chicago, IL 60604

Dear Mrs. LaPaire:

What a spectacle EPA has created! Lead in the ground in Granite City? If the pile of dirt at Taracorp is not large enough, EPA will make it more spectacular by building it larger than Monks Mound. The problem is EPA could have started eleven years ago with the great lead pile when reported to Illinois and USEPA by the Granite City Air Pollution Departments, Engineers and Inspectors.

It's like gangbuster's annual inspections by a team of USEPA inspectors who made sure functioning of the Granite City Air Pollution Department was proper. No one paid attention to the lead pile although the super fund was available.

Frightening people with publicity is harming the image of Granite City nearly comparable to Times Beach. Also, cleaning up 55 blocks as was reported is disastrous to say the least. This would encompass the entire Quad City area.

We should have an independent firm to conduct an accurate testing of the surrounding soil pile for the scope of any dirt contamination before any more hysteria is created without facts.

By all means, eliminate the lead pile now and make corrective actions only in areas where needed. Let Granite City go on with its business.

Sincerely,

Casmer Skubish

CASMER SKUBISH
1st Ward Alderman
(Former Granite City
Air Pollution Dept
Inspector)

February 22, 1990

MaryAnn Croce LaFaire
U.S. EPA(5PA-14)

Dear Sirs:

As a homeowner in Granite City and in site#8, my first concern is the health risks involved with soil that has over 500ppm lead contamination. What level of lead is in site area#8 and how much direct contact would it take to become dangerous to my health? Can I send a sample of my yard to have it tested?

My next concern is my property value. Am I to take a loss for something which was not my fault? The EPA Alternative H is not, in my opinion, an acceptable solution to the cleaning up of hazardous waste from the Granite City area. It kills any chance that Granite City has for downtown development, creates a landmark of hazardous waste, and destroys the ecconomics of hundreds of homeowners. This problem has to be addressed but a better alternative must be found.

Lastly, if the EPA implements one of the plans which calls for the removal of dirt from residential areas; (1) Would the residents be allowed to stay in thier homes? (2) Would the EPA have to tear up fences to remove the soil? (3) Would trees be damaged by this soil removal? (4) After work would be completed would it be considered safe and, in accordence with Illinois law, would realitors have to mention anything to potential buyers in this area? (5) When would the work start?

Tom Messina

Tom Messina
2207 Edison
Granite City, Ill. 62040

March 4, 1990

U.S.E.P.A.

To whom it may concern: after all the meetings and reading the papers I think this is all political. My family has lived here about 3 blocks from the N.L. Jarsicop site and have had nothing but health problems. The water stinks and we can't drink it and the kids aren't allowed to play in the dirt. We have lived here since 10-80 and come from the country where there was fresh air and good water. We the people in this neighborhood know there's a problem, however the mayor and the residents live in this neighborhood, all the mayor was worried about was getting the new companies and stores in to the down town area and if we have a problem that will stop his plan. Do we feel he isn't worried about us. They said we were tested in 1983 my family was never tested neither was my dog or water. My daughter just had to have emergency Kidney surgery on Nov. 89 and they don't know why they say she has a fungus but they don't know what it is. My husband, myself + 5 years of son has breathing problems and so does alot of people on this block. People just don't stay sick all the time for know reason. Also Gratiot City Steel has a lot to do with it. In the last 2-3 years all of are cars were covered with what looked like metal shavings are something and when you got into your car and started it up and turned on your air or heat the stuff would blow right up in your face and you breathe it in. We also have a lot of people including my family with cancer, heart [illegible]

who we to [illegible] to look out for
us I hope we are the ones who will do that
I don't think a small clean up will solve the
problem but I don't think our lives can measure
by dollar signs Thank You
Alice F. Mabry
618-451-1407

P.S. We've been buying our water for years so we don't
have to drink the water

March 12, 1990

EPA Region 5
230 South Dearborn St.
Chicago, Illinois 60604

My name is John Ciucina and I own three pieces of commercial property at 1420, 1430 and 1460 State Street in Granite City, Illinois. This property is located at the corner of 15th and State Street. I am very opposed to EPA's proposed clean up plan of the lead pile at the N/L Taracorp site which is located across the street from me. If this were done according to the EPA plan, that pile of lead would be on my front steps. This would drastically reduce the value of my property even more than it already has. Therefore, I recommend an EPA buyout or a relocation.

Thank You
John Ciucina

125 BOOKER STREET
MADISON, ILLINOIS 62060-165
PHONE: 618 452-1871

FEBRUARY 22, 1990

MARY ANN GRACE LAFAIRE
U.S. EPA C5PA - 14
230 SOUTH DEARBORN STREET
CHICAGO, ILLINOIS 60604

DEAR MRS. MARY ANN GRACE LAFAIRE;

WE, THE RESIDENTS OF EAGLE PARK ACRES, MADISON COUNTY MADISON ILLINOIS 62060-1657 ATTENDED THE EPA MEETING FEBRUARY 8, 1990 7:00 PM AT THE GRANITE CITY TOWNSHIP HALL 2060 DELMAR GRANITE CITY, ILLINOIS. OPEN OUR UNDERSTANDING ON U.S. AND ILLINOIS EPA CLEANUP CONTAMINATED SITES.

EAGLE PARK ACRES OUR COMMUNITY EXPOSUAE TO THE CONTAMINATED BATTERY CASE MATERIAL WHICH WAS USED TO FILL DITCHES, HOLES. ALSO USED FOR DRIVEWAYS STREETS AND ALLEYS...
PUMPS (WELL) WATER MANY RESIDENTS USED AS OUR SOURCE OF WATER.
THANKING YOU KINDLY FOR YOUR CONSIDERATION FOR ALL RISKS.

SINCERELY Bettie A. Hunter

TRI-CITIES AREA
CHAMBER OF COMMERCE
1831 DELMAR AVENUE GRANITE CITY, ILLINOIS 62040 ■ PHONE (618) 876-6400

March 9, 1990

U.S. EPA (5PA-14)
MaryAnn Croce LaFaire
230 South Dearborn St.
Chicago, IL 60604

Dear Ms. MaryAnn Croce LaFaire:

The Tri-Cities Area Chamber of Commerce wishes to respond to your proposed Clean-Up Action at the N L/Taracorp superfund site with the following comments:

* Public health risk should be paramount.

* None of the alternatives Proposed are acceptable in their present form.

* The issue of what the proper clean up level should be must be resolved. Only a site specific risk assessment can properly address this question. US EPA has established a standard of 500 ppm: N L Industries on advice by their independent expert consulting firm states that levels well above 1000 ppm pose no threat to human health and a level of 1000 ppm. provides an adequate margin of safety.

* The area or areas to be cleaned up should be confined to those area that are proven to pose a health hazard. The difference between a standard of 500 ppm. and 1000 ppm. grossly impacts the size of the total area that may need remedial action.

* Remedial Action should begin at once and completed as soon as possible if the site specific risk assessment indicates the need.

* Disposition of hazardous waste materials should be thorough and permanent or long lasting. It should be of a beneficial nature to the neighborhoods affected in order to restore their viability as a place to live and do business.

Sincerely,

R C Bush

R C Bush,
Executive Vice President

RCB:ksa

ILLINOIS DEPARTMENT OF
PUBLIC HEALTH
A Healthier Today For A Better Tomorrow

Bernard J. Turnock, M.D., Director

#411038801H

February 23, 1990

Mary Ann Croce LaFaire
U.S. Environmental Protection Agency
(5PA-14)
230 South Dearborn Street
Chicago, IL 60604

Dear Ms. LaFaire:

In the matter of the remedial action proposed for the NL/Taracorp NPL site located in Granite City (Madison County), Illinois, the Illinois Department of Public Health wishes to make the following points for the record.

1) While there can be no dispute as to the potential hazard posed by lead in the environment, particularly to sensitive populations, there appears to be substantial variation, or at least uncertainty, regarding the hazard posed by lead in soil to exposed populations. This is evidenced by numerous studies (attachment #1) as well as by the fact that, while the Metro East St. Louis (Illinois) area has serious soil lead contamination problems throughout, frank lead poisoning occurs only in certain areas. The obvious conclusion is that the characteristics of the population atop the soil is as important as, or perhaps more important than, the lead content of the soil beneath. The contribution of lead in household dust and air may be considerable and more important than that of soil lead. Additionally, the chemical form of the lead is an important determinant of potential hazard. Absorption of lead can vary over an order of magnitude depending on this parameter. In this light, it becomes important to thoroughly evaluate all such parameters that may come into play in making decisions regarding remedial action. Site specific clean-up numbers and/or remedial actions would seem most appropriate in such situations. The statement that a risk assessment could not be performed or utilized because a USEPA verified Reference Dose for lead is unavailable is specious. Toxicology and its applied aspects existed as a science before the advent of Reference Doses and will continue after they have been replaced. A competent toxicological evaluation and exposure assessment can serve perfectly well as a risk assessment for this population.

2) Given these observations it is questionable to rely on a generic clean-up level which appears to be solely derived from a CDC recommendation regarding lead in soil. The danger is two-fold:

   1) While it is true that CDC has stated that levels of 500-1000 parts per million (ppm) lead in soil can lead to bioaccumulation, and hence elevated blood lead, in children, this generally is only considered likely for children suffering from pica or other unusual exposure patterns. This level has not been suggested for clean-up, but only evaluative purposes. Soil removal has often not been recommended by CDC until the lead reaches much higher levels, perhaps as high as 5000 ppm (Henry Anderson, M.D., Wisconsin Department of Health Services, personal communication).

   2) Since most urban, industrialized areas have soil lead in the range of the proposed clean-up levels, a dangerous precedent is set by relying solely on generic remedial levels without considering the ramifications mentioned above. If USEPA insists that 500 ppm lead in soil is best number to protect public health and welfare, we will be happy to follow their lead by proposing for inclusion on the Superfund list multiple sites in the area that exceed this level, including much of the City of East St. Louis.

   There has in fact, been no specific recommendation from any health agency that a soil level of 500 ppm is appropriate for the Taracorp site. To suggest otherwise is disingenuous. It is considered possible that such a level is either too protective or not protective enough of this particular population. The Illinois Department of Public Health will neither support or reject the proposed 500 ppm clean-up level since its representatives were not party to the discussions involving the remedial action. Since USEPA has repeatedly stated that this action is based on health concerns, it is wholly unacceptable that the lead agency for health in Illinois was not consulted by USEPA regarding these issues during the eight years that the Taracorp site has been under investigation. The Illinois Environmental Toxicology Act requires the Illinois Department of Public Health to evaluate potential or actual exposures to hazardous substances and assess the degree of risk associated with such exposures. IDPH maintains a professional staff to carry such assessment and will do so whether consulted by USEPA or not. There is an obvious potential for conflicts when two or more agencies are pursuing the same basic objective without consulting one

another. Such problems can be avoided by the simple expedient of making an effort to involve all appropriate agencies from the outset.

3) The issues of risk assessment and clean-up objectives can be resolved simply by utilizing the extensive knowledge base that exists for lead. Specifically, the population can be stratified according to its exposure to soil lead and be tested one or more times for blood lead levels. Control for other sources of lead exposure would also have to be accomplished. Those areas that have populations which have statistically elevated blood lead levels when compared to a local control group would be candidates for remediation. It is assumed that safety factors would also be incorporated in the remedial action to protect pica children or fetuses carried by women whose bone lead (mobilized during pregnancy) might be elevated as result of their exposure to soil lead in this area. Useful preliminary or additional information could be derived from testing domestic animals (dogs and cats) residing in the affected areas. The design of such studies and the methods for biomonitoring already exist and are widely accepted. While one can argue with a risk assessment and its multiple assumptions and uncertainties, it is much more difficult to refute the results of direct measure of human exposure. Such actions would additionally go far to assure the public of the basis for proposed remedial action, answer the public's question about their safety, and focus the remedial efforts in areas of actual need. Given the cost in time and money of the preferred alternative action, as well as the largely unexplored risks associated with evacuation and remediation options, it seems foolish not to take the relatively simple and comparatively inexpensive step of monitoring the population-at-risk and incorporating this information into the decisions regarding the remedial investigation. Aside from attempting to answer numerous troublesome questions, such an effort also satisfies the requirement for site-specificity in risk management.

4) Among the numerous questions raised by citizens was the issue of what could the people do in the rather lengthy period between the start and finish of the remedial action to protect themselves and their families from the hazards of lead. An educational effort of some sort is required to answer this and similar questions. Since it appears that only a cursory effort has been made by USEPA in this regard and it is unclear whether any additional effort is to be forthcoming, it has been suggested to the Illinois Environmental Protection Agency (IEPA) that a joint effort with IDPH be made to address areas of confusion and concern.

The lack of communication on the part of USEPA has lead to a good deal of unnecessary alienation, anger, and fear on the part of the citizens and their representatives, and placed USEPA's proposed action in jeopardy. Some action is required to remedy this situation.

In summary, the Illinois Department of Public Health supports all actions that serve to protect the health of the citizens of Illinois; however, it has not been adequately demonstrated to this Department that the proposed action meets that criterion. Given the questions that remain, the Illinois Department of Public Health will neither support nor reject USEPA's proposed action at Taracorp. Further, we would urge that a carefully designed and implemented biomonitoring program be instituted to answer citizen concerns and address remediation issues on a firmer, scientific basis. It should be noted that such an approach is under consideration by this Department.

Sincerely,

Thomas F. Long
Senior Toxicologist
Environmental Toxicology Program

cc: Ken Miller, IEPA/LPC
Virginia Wood, IEPA
Division of Environmental Health, Region 4, Edwardsville
Clinton C. Mudgett, Chief
Division of Environmental Health
Byron J. Francis, Associate Director
Office of Health Protection
Don Payton,
Office of Governmental Affairs
Chris Atchison, Assistant Director
Louise Fabinski, ATSDR/Chicago
Central Office Files

Table 1 Summary Table of Blood Lead:Soil Lead Relationship from Studies in Communities with Operating Smelters

Author	City/Study Population	Soil Lead	Housedust Lead	Slope*
Angle & McIntire, 1979	Omaha, NB Age: 1-18 yrs N = 1075	Geom x = 227 ppm 95%tile = 843 ppm (range: 16 - 4,792 ppm)	Geom x = 337 ppm 95%tile = 894 ppm (range: 18 - 5,571 ppm)	6.8 [a]
Yankel et al. 1977	Kellogg, ID Age: 1-9 yrs N = 860	x = 7000 ppm (as high as 24,000 ppm)	x = 11,000 ppm (as high as 140,000 ppm)	1.1 [a]
Panhandle District et al. 1986	Kellogg, ID Age: 1-9 yrs N = 364	Geom x = 481 ppm (far) 3,474 ppm (near)	Geom x = 1,138 ppm (far) 3,933 ppm (near)	3.0 [b]
Roels et al. 1980	Belgium Age: 10-14 yrs N = 148	<1 km from smelter 2,000 - 6,000 ppm	N/A	3.5 [c]
Neri et al. 1978	Trail, British Columbia Age: 1-3 yrs N = 87 Age: 1st grade N = 103	Group x in different areas of Trail ranged from: 225 - 1,800 ppm	N/A	7.6 [a] for 1-3 yrs 4.6 [a] for 1st graders
Walter et al. 1980	Kellogg, ID Age: 1-9 yrs N = 983	Not given; presumably similar to Yankel et al, 1977	Not given; presumably similar to Yankel et al, 1977	1.1 [a] average for ages 2-7 yrs
Roberts et al. 1974	Toronto, Ontario mixed adults/children N = 80	Group arith. x ranged from: 100 - 2,626 ppm	Group arith. x ranged from: 845 - 2,005 ppm	4.0 [b]

N/A not available

* defined as the increase in blood lead (ug/dl) per 1,000 ppm increase in soil lead

[a] calculated by EPA (U.S.EPA, 1986) - takes into account other sources of exposure

[b] ^PbB (ug/dl)/^PbS (ppm) - does not take into account other sources of exposure (calculated by Gradient)

[c] calculated by Duggan & Inskip, 1985 - corrected for increase due to inhalation of air lead

Table 2 Summary Table of Blood Lead:Soil Lead Relationship from Urban Areas Without an Operating Smelter

Author	City/Study Population	Soil Lead	Housedust Lead	Slope*
Galke, 1975	Charleston, SC Age: 0-5 yrs N = 194	Geom x = 585 ppm (range: 9 - 7,890 ppm)	N/A	1.5 [a]
Stark et al. 1982	New Haven, CT Age: 0-1 yrs N = 153	Five levels of SES (group mean: 233 - 1,327 ppm); Seven categories of housing construction (group mean: 131 - 1,300 ppm)	For levels of SES (group mean: 159 - 628 ppm); For housing construction categories (group mean: 239 - 756 ppm)	2.2 [a]
Shellshear et al. 1975	Christchurch,New Zealand Age: 1-5 yrs. N = 68	Soil lead range: 150 - 1,959 ppm	N/A	3.9 [d]
Bornschein et al. 1986	Cincinnati, OH Age: 1.5 yrs. N = 81	Geom x = 1,360 ppm (range: 76 - 54,519 ppm)	Geom x = 900 ppm (range: 82 - 13,820 ppm)	6.2 [c] from 0-1,000 ppm soil lead Estimated slope: 0.76 [c] from 1,000-2,000 ppm
Bornschein et al. 1988	Cincinnati, OH N/A	N/A	N/A	1.2 [c] when soil lead increased from 500-1,000 ppm
Reeves et al. 1982	New Zealand Age: 1-3 yrs N = 195	Soil lead range: 24 - 842 ppm	N/A	5.5 [b]
Rabinowitz et al. 1985	Boston, MA Age: 0-2 yrs N = 249	Group mean soil ranged from 380 - 1,011 ppm	N/A	8.1 [b]
Minnesota 1987	Minneapolis-St. Paul, MN Age: 0-5 yrs N = 656	(range: 0 - 30,000 ppm)	N/A	2.7 [b]

N/A not available

* defined as the increase in blood lead (ug/dl) per 1,000 ppm increase in soil lead

[a] calculated by EPA (U.S.EPA, 1986) - takes into account other sources of exposure

[b] ^PbB (ug/dl)/^PbS (ppm) - does not take into account other sources of exposure (calculated by Gradient)

[c] calculated by authors - takes into account other sources of exposure

[d] calculated by Duggan & Inskip, 1985 - takes into account air lead exposure

Table 3 Summary Table of Blood Lead:Soil Lead Relationship from Mining Sites

Author	City/Study Population	Soil Lead	Housedust Lead	Slope*
Bornschein et al. 1988	Telluride, CO Age: <6 yrs N = 94	Geom x = 178 ppm	Geom x = 281 - 567 ppm	2.2 [c] based on increase from 500-1,000 ppm soil lead
Thomas et al. 1977	Halkyn & Y Fan, Wales Age: 39-62 yrs mean ages N = 78	Mine tailings in Y Fan: 42,000 ppm Halkyn - 44 km2 has >1,000 ppm soil lead	N/A	Significant trend in PbB in near vs. far resident males: near 21.9 ug/dl mid 19.0 ug/dl far 15.1 ug/dl
Gallacher et al. 1984	4 areas in Wales Age: 1-3 yrs N = 93	Geom x = for soil road 356 ppm deadend 271 ppm mining 1,167 ppm control 79 ppm	Geom x = for dust road 202 ppm deadend 177 ppm mining 350 ppm control 177 ppm	4.1 [b]
Heyworth et al. 1981	Northhampton, Australia Age: 5-14 yrs N = 81	Soil lead at town boundary: 300 ppm playground range: 11,000 - 12,000 ppm	N/A	No significant difference between children with homes on tailings piles vs. those who were not. PbB were significantly higher in children residing in town vs. non-residents
Baritrop et al. 1975	Derbyshire, England Age: 2-3 yrs N = 82	Geom x in areas with soil lead: <1,000 ppm 420 ppm >1,000-10,000 ppm 3,390 ppm >10,000 ppm 13,969 ppm	Geom x in areas with soil lead: <1,000 ppm 531 ppm >1,000-10,000 ppm 1,564 ppm >10,000 ppm 2,582 ppm	0.6 [a]
Baritrop et al. 1988	N. Petherton & Shipham, England Age: 3 yrs N = 178	Geom x = soil low 177 ppm high 1,850 ppm	Geom x = dust low 478 ppm high 879 ppm	0 [b]

N/A not available

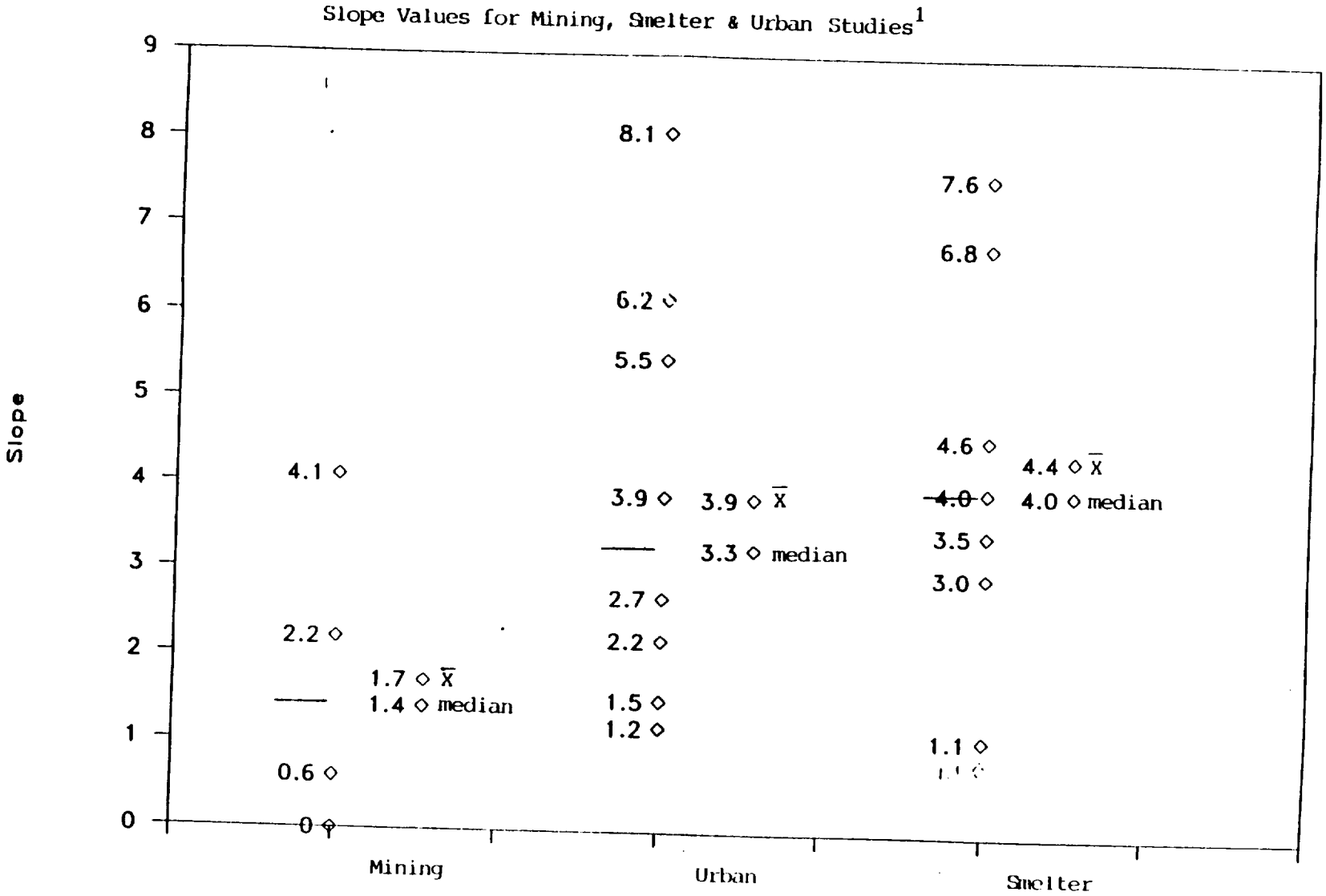
* defined as the increase in blood lead (ug/dl) per 1,000 ppm increase in soil lead

[a] calculated by EPA (U.S.EPA, 1986) - takes into account other sources of exposure

[b] ^PbB (ug/dl)/^PbS (ppm) - does not take into account other sources of exposure (calculated by Gradient)

[c] calculated by Duggan & Inskip, 1985 - corrected for increase due to inhalation of air lead

Figure 1



1 See tables 1-3 for references

Craig A. Tarpoff
2621 Madison Avenue
Granite City, Illinois 62040

March 12, 1990

MaryAnn Croce LaFaire
U.S.EPA Region 5
230 South Dearborn Street
Chicago, Illinois 60604

I ask that this letter represent my comments regarding the proposed NL/Taracorp clean-up project, Granite City, Illinois.

I would like to thank the U.S.EPA for working in our area to eliminate a silent but very serious health hazard. I am, however, disappointed by the manner in which it is being handled. Many of us in the Granite City, Madison, and Venice area want whatever clean-up necessary to protect our youngest citizens from the mental, physical and behavioral disorders associated with lead poisoning.

In the past few weeks, I have tried to read as much as possible regarding lead contamination. I accept the startling results from recent studies which identify the dangers of blood lead levels above 10 micrograms per deciliter. What I can not accept, is the proposed clean-up that you, the U.S.EPA, prefer.

In phone conversations with doctors at two large universities, I have learned that a major study, by the "Lead in Soil Task Force", has recently been completed. Their report is due to be released in July of this year. I have asked Mr. Brad Bradley, Remedial Project Manager, to contact Dr. C. Richard Cothern, U.S.EPA, in Washington D.C. Dr. Cothern is very familiar with this "lead in soil" study. After conversations with Drs. Cothern, Hemphill, Wixson, and Lower, I feel it would behove us to wait for the release of this study before a decision is made regarding the extent of the clean-up in our area.

On Monday, March 5, 1990, a toxicologist, representing the U.S. EPA, answered questions regarding soil lead levels and its effect on children under 6 years old. Relying on an unavailable study, the "Three City Study", we were told that 9 out of 10 children, within our clean-up area, are currently in danger with blood lead levels above 10 micrograms per deciliter. What I find most disturbing is, according to the U.S. EPA toxicoligist, at soil lead levels of 500 ppm, 6 out of 10 children will still have blood lead levels above 10 micrograms per deciliter!

How can you possibly propose any plan that would leave us with 60% of the children right outside the clean-up area at risk?

I question the wholesale comparison of our local situation with studies done in Boston, Baltimore, or Cincinnati. As I understand it, there are many variables that determine the amount of lead that is biologically available in the soil. Have these considerations been made? I understand from materials available in our public library, that due to mineral deficiencies associated with sickle cell anemia, black children, regardless of the family income levels, run a much higher risk of lead poisoning than white children from the same economic background. What percentage of children tested in these eastern cities are black? Would a large percentage of black children in a study change the conclusion? Are 6 out of 10 children in Granite City, Madison, or Venice really in danger from soil lead levels of 500 ppm?

Many of us in the area are confused, frightened, and angry. You must realize that the stigma of hazardous contamination is not only affecting personal property values, but also hindering our downtown redevelopment. Whatever clean-up is done must eliminate this stigma.

I ask that you consider the following:

1. The report from the "Lead in Soil Task Force" will be published in several months. This multi-year international study may answer many of the questions still unanswered. Please, wait for it. I am not convinced or satisfied with the comments from the U.S.EPA toxicologist. I found her information incomplete, confusing, and impossible to verify.

2. Immediately begin soil testing in areas where children congregate; grade schools, playgrounds, public parks, etc. Our largest park is only 4 blocks from the proposed clean-up area. We are quickly approaching that time of year when children are at greatest risk from lead in soil exposure. If our schools, parks, or playgrounds are contaminated we need to know now! Because it is impossible to determine what areas may contain contaminated fill, all schools, parks, and playgrounds throughout the Tri-City area must be tested.

3. Be certain that the final remedy satisfies what is necessary to protect as many children as possible. To leave us in a situation with large numbers of children at risk is unacceptable.

4. If the decision is made to place all soils and wastes on the Taracorp pile, then have a buffer zone and include height restrictions. This would permit some type of landscaping. Every possible effort must be made to prevent leaching and ground water contamination. To expose us, some time in the future, to pile removal, would be inexcusable. If there is any question as to the suitability of the Taracorp pile, then the pile and all clean-up wastes and soils must be taken off-site, to an EPA-approved hazardous waste landfill.

It seems foolish to carve into stone a final remedy that, sometime in the near future, might be considered wasteful or inadequate. Millions of dollars are to be spent, thousands of lives will be affected, therefore, regardless the cost, it will be cheaper doing it right the first time.

Respectfully,

Craig A. Tarpoff

cc: Dr. C. Richard Cothern,
Science Advisory Board, U.S.EPA

Dr. Bobby Wixon,
Dean, College of Sciences, Clemson University

Dr. Delbert Hemphill,
Enviromental Trace Substance Research Center, University of Mo.

Dr. Bill Lower,
Environmental Trace Substance Research Center, University of Mo.

U.S. Senator Alan J. Dixon, State of Illinois

U.S. Representative Jerry Costello, State of Illinois

Mayor Von Dee Cruse, Granite City, Illinois

MARY MARGARET NONN
WORK . 618 . 463 . 6404
1638 EDISON AVE.

In response to the EPA's statement that there is no immediate danger to the residents living near NL Industries, I would like to present the following facts:

My grandparents, Joseph and Margaret Nonn moved into this area, 1600 block of Edison Avenue, in 1912 with their three sons. They had another son, my father, and five daughters after moving here from St. Louis. Below is a summary of their medical history.

GRANDFATHER: Joseph F. Nonn. My grandfather died of a massive heart attack while working at Scullin Steel when he was 55 years old.

GRANDMOTHER: Margaret Wichmann Nonn. My grandmother lived to be 73 years old. When she was 65 they discovered a lump in her breast which required a radical mastectomy. She died of a massive heart attack at 73.

UNCLE: My father's oldest brother, Joseph F. Nonn, Jr. died when he was 59. He had cancer of the stomach. When Uncle Joe married, he and his wife lived at 1700 Cleveland Boulevard, Granite City, Illinois. His wife, my Aunt Lil died several years ago. As far as I know there was no trace of cancer. Joe had three boys. The oldest Richard was raised in Springfield, and died of a massive heart attack. The second, Raymond, was killed in a train-auto collision and the third, Robert is still living.

UNCLE: My father's second brother, Edward also died at 59. He died of cancer of the throat and lungs. His wife, Violet died of cancer of the kidneys when she was about 47. They both lived at 1704 State Street. They had a daughter, Sandra Kay, who died at 40 of cancer of the uterus which spread through her entire system. Sandra had four children, all of whom are living.

UNCLE: My father's third brother, Robert died when he was 58. He died of a massive heart attack but had been operated on two years before for a benign brain tumor. He had a son, Dennis who died at 26 of "galloping cancer." This was a term the doctor used because it spread so fast and affected all of the vital organs. They lived at 1704 Delmar Avenue. My uncle's wife, who still lives there with her second husband, has had a hysterectomy because of a malignancy and is scheduled for lung surgery next week. Her husband had a lung removed approximately 8 years ago.

FATHER: My father died in 1988. As far as I know he showed no sign of cancer.

AUNT: My father's oldest sister Margaret died when she was 58. She had hysterectomy at the age of 29; had a radical mastectomy many years later and died of lung cancer. She had one child, Judith, who, other than the removal of a tumor of the thyroid, seems to be in good health. For a while they lived at 1638 State Street, but moved out of the neighborhood when Judy was a baby.

AUNT: My Aunt Kathryn died at 59. She had a lump removed from her back which was malignant. This traveled to both breasts and she had both of them removed. Nothing could be done for her and she died from the mastectomy. She did not have any children.

AUNT: My Aunt Marie died in April of 1988. She was 72. She had a lump removed from her breast about 10 years ago which was benign; about 5 or 6 years ago she had to have a radical mastectomy. A lump appeared in her groin in the Spring of 1987 and she was operated on for that. There were malignancies all through her body and the surgeon believed that it was from the mastectomy. The surgeon who did the mastectomy of course does not agree. Her daughter Donna, at the age of 29, had a radical mastectomy. This was about 8 years ago. As of this date she is fine. Her youngest son, Raymond had a lump removed from his back several years ago, which was benign. Her other son seems to be fine.

AUNT: My Aunt Lucille died at the age of 46. She died of cancer of the stomach. She had no children.

AUNT: My Aunt Betty died at the age of 46. She died in a domestic accident. She had a benign tumor removed from her thyroid and had to have a hysterectomy because of a bad pap smear. Her daughter, Christine, had a benign tumor removed from her thyroid several years ago.

MY MOTHER: My mother died in 1981 of cancer of the lymph nodes. She had a malignancy in the colon which they removed, but the cancer spread into the lymph nodes. I have a sister, who at this writing is fine, and a brother, who at this writing is fine. I, too, seem to be fine.

I would like to add this to the above. My mother's family came to this country from Scotland when she was 12, or in 1927. They settled in the 1800 block of Grand Avenue. My grandmother died of a massive heart attack; my grandfather died of cancer of the kidneys; my mom's only brother died of cancer of the lungs; her half-sister died of cancer of the uterus and her eldest half-sister died from cancer of the breast in November of 1989.

I believe that the history of cancer in my family is more than mere coincidence or a weakness in our immune system. I believe that the demise of my family is directly tied to the

lead and other foreign particles in the air and in the ground. The statement by EPA that there is no immediate danger to the residents in this area is absolutely ludicrous and intends to give the residents a false sense of security. To borrow a phrase, "There is a clear and present danger" and the clean up project should start now, not in 1991 or thereafter, even then it may be too late.

College of Sciences
OFFICE OF THE DEAN

CLEMSON UNIVERSITY

March 12, 1990

Ms. Mary Ann Croce LaFaire
U.S. Environmental Protection Agency
Region 5
230 S. Dearborn Street
Chicago, IL 60604
FAX 312-353-1155

Dear Ms. LaFaire:

As discussed with you on the telephone, I would appreciate the opportunity to make comment on the 500 ppm lead proposed for clean up standards in Granite City, Illinois.

During the past two years I have served as chairman of the Society for Environmental Geochemistry and Health (SEGH) task force developing a report that would suggest guidelines for lead in soil. This came as a concern that there were no recognized U.S. guidelines for lead in soil based on scientific documentation and evaluation of pertinent data. I am sending you copies of publications presented concerning this matter.

As a result of the concern shown in 1987, due to the lack of scientifically based guidelines, a special conference on "Lead in Soil: Issues and Guidelines" was held in North Carolina in March, 1988 under the auspices of the U.S. EPA, International Lead Zinc Research Organization, Inc., Lead Industries Association, the Society for Environmental Geochemistry and Health (SEGH) and the College of Sciences and Engineering at Clemson University, South Carolina. At this conference the most knowledgeable experts in the medical, public health, regulatory, industrial and scientific communities summarized our present state of knowledge on lead in soil with the end focus of developing possible approaches concerning criteria and guidelines for lead in soil. All participants were in agreement that no single number or abatement approach applies to all sites. It was further suggested that SEGH task force be formed to develop a "Phased Action Plan" with a matrix approach through a target blood lead to soil lead model for protection of the population selected. The task force was then formed and we have now sent our draft report out for review. A publication on the task force progress as of June 1989 is enclosed illustrating the derivation of a lead in soil model using blood lead concentrations. This is further expanded with documentation in the task force report.

The North Carolina conference proceedings have now been published by Science Reviews Ltd. (London) as a monograph series 4, Supplement to Volume 9 of Environmental Geochemistry and Health entitled "Lead in Soil: Issues and Guidelines" edited by B. Davies and myself (B. Wixson).

I have summarized pertinent data from the book so as to best inform you and your office of our concern in adopting 500 ppm lead in soil or dust as an interim guideline without knowledge of the action plan on target blood lead soil model which is based on the protection of the most sensitive population blood lead levels selected. The use of the proposed 500 ppm does not address site specific problems, end land use or populations at risk since the number may be higher (or lower) based on the health criteria used for deriving a target soil/dust lead guideline concentration model.

The economics problems of enforcement and costs of remedial actions (if necessary) may then become a major consideration if the level selected is not only too low but not practical for the intended purpose of protecting public health. Please note that our task force (listed by name and affiliation in the summary paper) remain concerned that a matrix approach to a site specific location and population at risk be used rather than a specific number.

The task force report (over 200 pages) documents the criteria to be recommended with scientific literature and data pertinent to lead in soil. Furthermore, the task force has worked in close cooperation with the U.S. Environmental Protection Agency in developing a realistic, practical model to address this critical problem. Therefore, this information should be of great applied value to groups such as yours in recommending the appropriate guidelines for lead in soil or dust.

Thank you for allowing me to make these comments and send additional information on behalf of the SEGH task force on lead in soil. Please contact me if I may furnish additional information on this most important issue concerned with the protection of public health.

Sincerely yours,

Bobby G. Wixson
Dean, College of Sciences

BGW:jeg

Enclosures

cc: SEGH Task Force

STATUS REPORT ON THE SOCIETY FOR ENVIRONMENTAL GEOCHEMISTRY AND HEALTH TASK FORCE ON LEAD IN SOIL

by

Bobby G. Wixson
College of Sciences
Clemson University
Clemson, South Carolina 29634-1901

Presented at
Trace Substances in Environmental
Health XXIII Conference

Cincinnati, Ohio

May 31, 1989

STATUS REPORT ON THE SOCIETY FOR ENVIRONMENTAL GEOCHEMISTRY AND HEALTH TASK FORCE ON LEAD IN SOIL

Bobby G. Wixson
Clemson University
Clemson, South Carolina

Abstract

Based on recommendations initiated at the 1986 Trace Substances Conference and the March, 1988 Conference in North Carolina on "Lead in Soil: Issues and Guidelines" (1989) the Society for Environmental Geochemistry and Health (SEGH) formed a special task force to propose guidelines for "Lead in Soil." The first meeting of the task force was held in December 1988 in Cincinnati, Ohio and a protocol for a phased action plan was developed based on scientific documentation and case studies on the environmental aspects of lead in soil.

The phased action plan was further modified by the SEGH task force at the May 1989 meeting in Cincinnati, Ohio to guide the decision making process based on sampling and analytical information. The decision protocol developed may also be used for other contaminants requiring a scientific approach to the development of recommendations and guidelines.

An action matrix for lead in soil was derived by a model using blood lead concentration equated to a baseline level plus an increment due to soil and dust lead. This model has flexibility for various levels of blood lead concentrations and allows for a variety of environmental situations and regulatory criteria.

The task force schedule leading to a final report is presented for the external review, revision and SEGH approval of the report prior to submission to the U.S. Environmental Protection Agency (EPA), and other interested agencies and industries concerned with lead in soil.

INTRODUCTION

The lack of a U.S. standard for the concentration of lead in soil has contributed to confusion among regulatory agencies, industries, public health officials, the medical community and citizens concerned with the evaluation or remediation of lead contaminated soils. This concern was emphasized in a special session of the 1987 Trace Substances in Environmental Health Conference through a presentation on Lead in Soil: How Clean is Clean? by Davies and Wixson (1986).

As a result of the concern expressed, a special conference on "Lead in Soil: Issues and Guidelines" was then held in Chapel Hill, North Carolina in March 1988 through sponsorship of the Society for Environmental Geochemistry and Health (SEGH), the United States Environmental Protection Agency (EPA), the International Lead Zinc Research Organization (ILZRO) and the Lead Industries Association (LIA). Over thirty pertinent summary papers were presented and have been published in the conference proceedings. The conference closed with panel and audience discussion on

suggestions for possible approaches to be used in the development of guidelines for lead in soil. A 'phased-action plan" approach was then suggested (1988) along with the formation of a SEGH task force to evaluate the conference proceedings and develop a report on this matter.

In June 1988, a SEGH task force was formed and the "Lead in Soil: Issues and Guidelines Conference Summary" was presented by Wixson (1988) at the Trace Substances in Environmental Health Conference.

The "Lead in Soil" task force is composed of SEGH members and represents a balance of qualified scientists from regulatory agencies, industries, medical, public health and environmental researchers concerned with lead in soil. The task force has been supported by ILZRO, LIA and EPA to develop a report utilizing a matrix approach for a "phased action plan" for lead in soil.

The SEGH task force has now held two major three-day meetings and completed the necessary scientific documentation to support the draft report. A "phased-action plan" has been developed along with a flexible action matrix for lead in soil derived through a model using blood lead concentrations equated to a baseline level plus an increment due to soil and dust lead. Such a model offers flexibility for selection of target levels of blood lead concentrations while allowing for a variety of environmental situations and regulatory criteria. This status report of the SEGH task force on lead in soil illustrates the major points addressed and discusses the schedule for completion of the report.

SEGH TASK FORCE MEMBERS

The SEGH task force for "Lead in Soil" is composed of the following members:

Robert Bornshein
University of Cincinnati
Cincinnati, OH

Rufus Chaney
U.S. Department of Agriculture
Beltsville, MD

Willard R. Chappell
University of Colorado-Denver
Denver, CO

Julian Chisholm
Francis Scott Medical Center
Baltimore, MD

Rick Cothern
US EPA
Washington, DC

Brian Davies (co-chairman)
University of Bradford
Bradford, England

Howard Mielke
Xavier University of Louisiana
New Orleans, LA

Al Page
University of California
Riverside, CA

Pamela Stokes
University of Toronto
Toronto, Canada

C. D. Strehlow
Westminster Children's Hospital
London, England

Iain Thornton
Imperial College
London, England

Rosalind Volpe
International Lead Zinc
Research Organization, Inc.
Research Triangle Park, NC

Dan Vornberg
Doe Run Co.
Herculaneum, MO

Bobby Wixson (chairman)
Clemson University
Clemson, SC

Betsy Kagey (alternate)
Empire State College
Glens Falls, NY

Robert Putnam (alternate)
International Lead Zinc
Research Organization, Inc.
Research Triangle Park, NC

REPORT OUTLINE

The report on lead in soil will utilize the following format:

I. INTRODUCTION

II. DEFINITIONS

III. PHASED ACTION PLAN - including a flow chart for the decision making process

IV. EXPLANATION-DECISION MAKING
(relatively few pages)

V. APPENDICES

A. Procedures
B. Resource Data
C. References

PHASED ACTION PLAN

A "phased-action plan" or protocol for users to follow was developed by the SEGH task force. Each decision requires scientific evaluation based on documentation. In the final task force report each decision step will have an explanatory paragraph explaining procedures that need to be followed. Sampling and analytical procedures will be further specified in the appendices.

The flow chart for the phased action plan is illustrated in Figure 1. Specific details associated with each step will be discussed in detail in the report and not covered in detail in the status report.

ACTION MATRIX FOR LEAD IN SOIL

The task force determined that a soil standard should be developed to protect the most sensitive human, young children. However, a single number was considered unrealistic for a number of reasons. Various levels of blood lead concentrations are used as standards around the world and these levels are changing as different criteria and effects of lead are considered. The environment of the population at risk can vary widely, from urban dusts derived from automotive emissions and leaded paints to smelter emissions, old mining areas, or waste disposal sites. The population at risk can vary to include situations where there is a high proportion of young children, a retirement home for the elderly, or vacant land proposed for development. Because of these

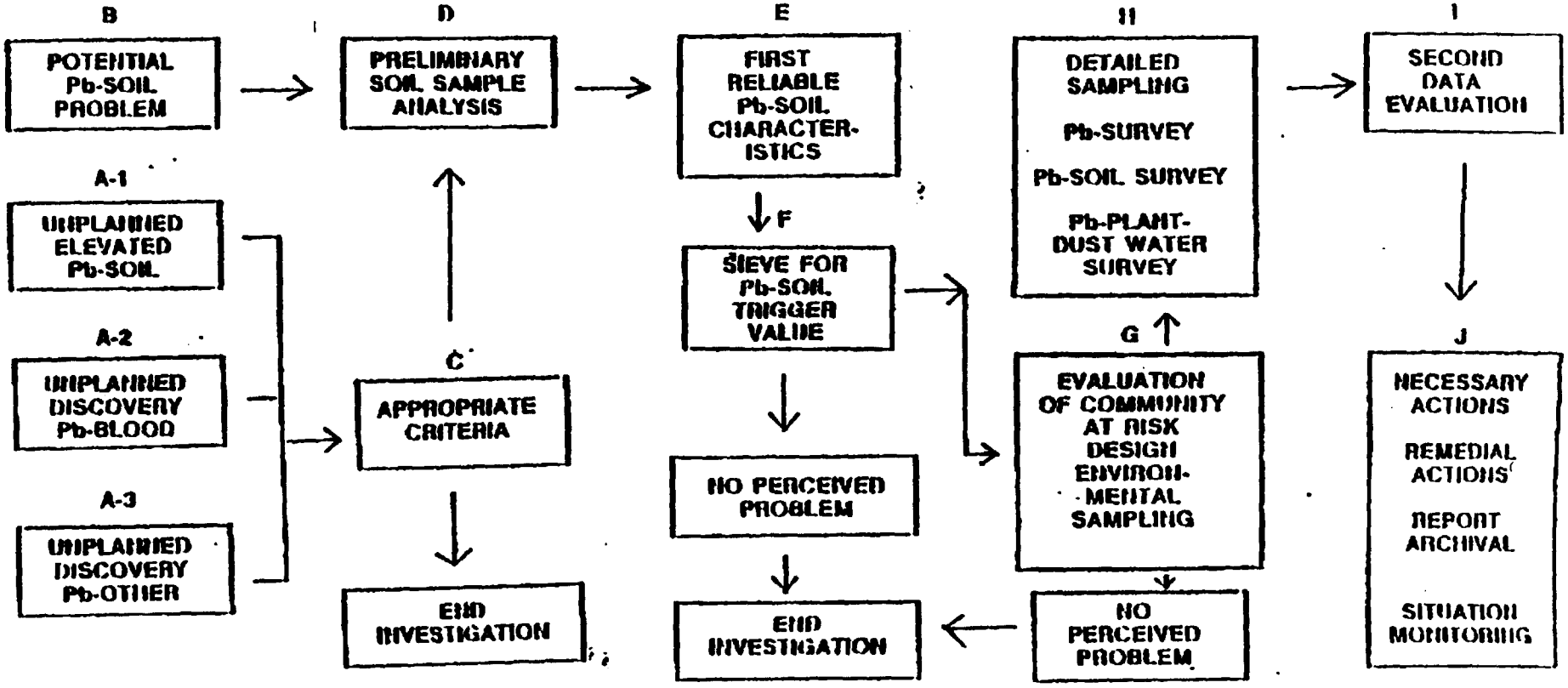


FIGURE 1 - PHASED ACTION PLAN OR PROTOCOL FOR ENVIRONMENTAL ASPECTS OF LEAD IN SOIL

considerations, the soil lead matrix standard was developed as a relationship or formula in order to allow for a variety of environmental situations and regulatory criteria.

In the model used by the task force, blood lead concentration is equated to a baseline level plus an increment due to soil or dust lead. The soil lead matrix standard recommended here is derived from the blood lead standard or target concentration used and the degree of protection required in the population. The baseline level takes into account exposure from all other sources so that any significant contributions from other sources - air, paint, or water, must be added to 'natural' uncontaminated levels. The slope of the blood lead-soil relationship can thus vary depending on a variety of factors, and this response can be adjusted for a given situation and modified as more data become available.

The blood lead - soil lead relationship developed by the task force is presented in Figure 2.

Some examples of how various calculations might be applied are illustrated in Table I. Given the conditions noted and selecting the target blood lead and percentage of the population to be protected, the amount of soil lead (in ppm) may be determined.

Table II illustrates the protection of 99% of the target population when the acceptable blood lead is 15 µg/dl with changes in the slope or response of the blood-lead; soil (dust) lead relationship.

Various factors were considered in choosing a slope relating soil/dust lead concentration to blood lead levels and while the range of slopes reported is wide (from 0.6 to 9.6 µg/dl per 1000 ppm lead in soil or dust) a value in the range of 2-5 appears to be appropriate for most situations.

The various factors considered, review papers, and case studies cited will be discussed in detail in the task force report. Values selected could also be modified based on future blood lead research data.

REPORT SCHEDULE

The SEGH task force is working toward the following schedule for their report on lead in soil.

1. August 1989 — Completion of the draft report to task force members for comment.
2. Late August 1989 — Modifications and submission of the report to external review.
3. November 1990 — Receipt of comments, revisions and changes in report.
4. December 1989 — Request report approval by SEGH executive committee.

$$S = \frac{\left[\frac{I}{G^n} - B\right]}{\delta} \bullet 1000$$

S = SOIL LEAD CONCENTRATION ppm

T = TARGET Pb-BLOOD μg/dl

G = GEOMETRIC STANDARD DEVIATION OF BLOOD LEAD DISTRIBUTION

n = NUMBER OF STANDARD DEVIATIONS CORRESPONDING

B = BACKGROUND OF BASELINE Pb-BLOOD - OTHER SOURCES

δ = SLOPE OF Pb-BLOOD/Pb-SOIL RELATIONSHIP μg Pb/dl PER 1000 ppm

FIGURE 2 - DERIVATION OF A LEAD IN SOIL MODEL USING BLOOD LEAD CONCENTRATIONS

TABLE I. ACCEPTABLE SOIL LEAD LEVELS DETERMINED BY THE TARGET BLOOD LEAD AND PERCENT OF POPULATION TO BE PROTECTED

TARGET Pb Blood µg/dl	% POPULATION < Pb-Blood			
	50	95	99	99.9
10	3000	875	300	-
15	5500	1800	1500	700
20	8000	3750	2600	1600
25	10000	5200	3700	2500

δ = 2, B = 4, GSD = 1.4

TABLE II. PROTECTION OF 99% OF THE TARGET POPULATION USING A BLOOD LEAD VALUE OF 15 µg/dl AND CHANGING THE SLOPE OF THE BLOOD-LEAD; SOIL (DUST) RELATIONSHIP

99% < TARGET

Pb-BLOOD = 15 µg/dl

GSD = 1.4		δ = 2	
δ	S		S
1	3000	1.3	2100
2	1500	1.4	1500
4	750	1.5	930
6	560	1.6	520
8	375	1.7	190
		1.8	-

S = SOIL LEAD CONCENTRATION IN ppm

5. January 1990 Submission of report/recommendations to EPA, other user groups.

Publication of report by the SEGH journal *Environmental Geochemistry and Health*
Publication of condensed report in other scientific journals.

SUMMARY

A status report on behalf of the SEGH task force on "Lead in Soils" has been presented. A phased action plan for decision making has been developed for lead in soil. A blood-lead standard or action matrix formula has been proposed for soil (dust) lead which allows for a variety of environmental situations and regulatory criteria.

The report outline and schedule for completion have been presented. Additional details will be contained in the final task force report projected for January 1990.

ACKNOWLEDGEMENTS

The support of the Society for Environmental Geochemistry and Health, the International Lead Zinc Research Organization, Inc., the Lead Industries Association and the U.S. Environmental Protection Agency is acknowledged. Special thanks also to the members of the lead in soil task force for their time and effort on this important project.

LITERATURE CITED

Davies, B. E. and Wixson, B. G. 1986. Lead in soil: how clean is clean? In: *Trace Substances in Environmental Health-XX*. Hemphill, D. D., Ed., University of Missouri-Columbia, 233-241.

Wixson, B. G. 1988. Overview on lead in soil: issues and guidelines conference. In: *Proceedings of lead in Soil: Issues and Guidelines*. Davies, B. E. and Wixson, B. G., Eds Science and Technology Letters, Surrey, England.

Wixson, B. G. 1988. Lead in soil: issues and guidelines conference. In: *Trace Substances in Environmental Health, XXII*. Hemphill, D. D., Ed., University of Missouri-Columbia, 349-356.

Lead in Soil: Issues and Guidelines. 1989. [illegible] B. E. and Wixson, B. G., Editors. *Science and Technol* [illegible]etters, Surrey, England

Re: N/L Juracorp Superfund Site

My husband and I attended both of the meetings in Granite City concerning this matter. So here it is the deadline for comments, and I have finally decided to say how I feel about this matter. To be honest with you I really don't believe it makes any difference what the residents have to say about this problem. Also it seems that very few residents are concerned about this because of the poor attendance at both meetings. Maybe you thought there were a decent number of people at the Township Hall on Feb. 8, 1988, but don't forget how many residents are supposedly in this contaminated area? 3000 Maybe there was a poor showing because many of these residents don't think they are in the contaminated area. They may believe they would have to live across the street from the lead pile to be in any danger. This matter seems to have had a lot of attention since the Feb. 8th meeting, but previous to that time no one thought much about this contamination. Why were the residents left in the dark

for so long while the EPA, IDPH, N/L Tarasoy were discussing it, and in turn our health & our childrens health are in jeopardy! Or is our health really in jeopardy? Why did the Health Dept only take blood lead tests on a few residents? Wasn't many more people affected by this? Why just a few tested? Also what time of the year were these people tested? Was it in the winter months when the levels would more likely be low. How accurate could this testing have been? So now the IDPH says they are willing to give blood tests if they can get the funding for it. How long will that take or will it ever be done? In the meantime we the residents are sitting & waiting for these decisions. We are helpless in this matter, while we will be the ones who will pay the price with our & our childrens health! Plus lets not forget about our property. My husband & I have tried to make improvements on our home and yard over the 15 years we have lived here (new siding, new storm windows, new roof, painting garage, painting in home & out,

remodeling inside. etc, etc, etc.) We did all of these improvements so we would enjoy living here & also we were thinking of the future. When the right time come along we were planning on selling our home and moving outside of Madison. Now who knows if there will ever be a right time to move. if we can even sell our home at all! I know I would not even consider looking at a home to buy if it has been labeled "contaminated", even if the soil had been dug up & new soil put in. If you plan on digging 6 inches. (less or more) I cant see how you wont be recontaminating the soil with dust blowing. Watering it down with a hose doesn't seem to be able to do the job effectively. You would have to be working with mud! Also what about the property where fill dirt had been put on top of the contaminated soil. When you test that soil you most likely will not show a high lead level. but its possible that this soil is really contaminated

It is my understanding that a decision will be made in a couple

& weeks regarding this cleanup. Since this matter has been knowledge to you & the other companys involved for so long & nothing has been decided on as of today, why cant you do more specific testing on the soil (**not** every 1,000 ft) but each & every yard before you make your final decision. I also think the alleys should be tested because who knows what was dumped 30 years ago & blew around the area. I would like to have blood tests, but I am not sure I would be relieved if the results were low since this is the middle of March. Isn't there another type of testing that can be done for lead poisoning? I would like to know. I have been a property owner for 15 years in this so called contaminated area but I have lived here all of my life (38 years) so I am really a concerned citizen.

I hope this has not been all blown out of proportion because the results may not be irreversible. I also have 2 children, ages 11 & 14 who have lived here their entire life, so I am also concerned about their health in the future. Hope

fully they wont have any effects from this, but no-one can predict what we will find out in 10 or 20 years

I do hope you will consider a more thorough & specific testing of the coal & health involved. Dont make a decision in 2 weeks on what may affect the lives of these people indefinitely.

Sincerely
Mrs Barbara Kary
Don Kary

lbk

DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, CORPS OF ENGINEERS
111 NORTH CANAL STREET
CHICAGO, ILLINOIS 60606-7206

REPLY TO
ATTENTION OF

Project Management Branch

12 FEB 1990

Mr. Morris Kulmer
P.O. Box 30076
Salt Lake City, Utah 84130

Dear Mr. Kulmer:

Reference is made to Mr. Schumacher's telephone conversation on February 2, 1990 with Mr. Timothy Kelleher of this office regarding the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP FUDS). As you are aware the Corps of Engineers is evaluating former Department of Defense (DOD) facilities to determine if unsafe or hazardous conditions exist as a result of DOD use or utilization. Enclosed is a fact sheet on the DERP FUDS program which briefly explains the purpose and goals of the program.

The former GRANITE CITY ARMY DEPOT - RAILROAD MARSHALING YARD (currently known as A & K Railroad Materials, Incorporated), Granite City, Illinois, was evaluated under the DERP FUDS. Based upon this evaluation it has been determined that the site is not eligible for environmental restoration under the purview of the DERP. The final Findings and Determination of Eligibility report is enclosed with this letter.

A copy of this report will be sent to Mr. Kern Schumacher, a co-owner of the property. Should you or Mr. Schumacher have questions regarding this report and the findings contained therein you may contact Mr. Kelleher at 312-886-0454.

Sincerely,

JOHN P. D'ANIELLO, P.E.
Chief, Engineering Division

Enclosures

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
FORMERLY USED DEFENSE SITES
FINDINGS AND DETERMINATION OF ELIGIBILITY
A & K RAILROAD MATERIALS INC. (GRANITE CITY ARMY DEPOT)
GRANITE CITY, ILLINOIS
PROJECT NO. E05IL056500

FINDINGS OF FACT

1. This report addresses a 44.05 acre portion of land and improvements formerly associated with Granite City Army Depot, Granite City, Madison County, Illinois.

2. The Department of Defense (DOD) acquired 1,222.49 fee acres and 0.25 license acres by condemnation and declaration of taking between 1942 and 1959 for the establishment of the Granite City Army Depot.

3. This site was associated with the Granite City Army Depot. The portion of land addressed in this report was used by Department of the Army as a railroad marshaling yard. It was improved with several buildings and extensive rail tracks. These improvements were built prior to DOD acquisition and, in some instance, by DOD.

4. Of the total 1,222.74 acres, 280.04 fee acres were transferred to St. Louis District Corps of Engineers between 1952 and 1958 for civil works purposes. 942.45 fee acres and 0.25 license acres were reassigned to Granite City Army Depot on 12 September 1972. 72.00 fee acres were declared excess to General Services Administration (GSA) on 11 September 1973. Of this 72.00 fee acres 26.05 acres are being retained in GSA inactive inventories, 1.90 acres were excepted by the U.S. Government, and 44.05 acres were sold by Quitclaim Deed dated 9 February 1987 to A & K Railroad Materials, Incorporated. Reserved on behalf of the U.S. Government were perpetual rights of ingress and egress over the 44.05 acre tract of land along with a perpetual nonexclusive right to use existing railroad tracks at the site. There are no restoration clauses in the Quitclaim Deed.

5. The only remaining DOD utilized improvement at the site is the railroad marshaling yard which consists of an extensive network of rail tracks. All other improvements have been removed by either DOD (prior to disposal) or by the current owner. The current owners (A & K Railroad Materials, Inc.) were contacted and a site inspection was conducted on 5 May 1988. The site is being used for storage of railroad equipment. The owners have not requested remedial actions be undertaken at the site. There is no evidence of unsafe debris, unexploded ordnance, or hazardous or toxic contamination as a result of DOD use of the site.

PROJECT NO. E05IL056500

DETERMINATION

Based on the foregoing Findings of Fact, the site has been determined to have been formerly used by DOD. However, there is no evidence of unsafe conditions resulting from DoD use and the owners have not requested restoration actions be undertaken. Therefore, it is determined that an environmental restoration project is not an appropriate undertaking within the purview of the Defense Environmental Restoration Program, established under 10 U.S.C. 2701 ET SEQ., for the reasons stated above.

26 September 1989
DATE

THEODORE VANDER ELS
Brigadier General, U.S. Army
Commanding

US Army Corps
of Engineers
Huntsville Division

PROGRAM FACT SHEET

HNDED-PM 1 MAY 1984

ENVIRONMENTAL RESTORATION DEFENSE ACCOUNT (ERDA)

SCOPE:

ERDA covers both active installations and formerly used DOD properties. Programs are already underway to address active installations. This fact sheet describes the portion of ERDA applicable to formerly used DOD properties.

PROGRAM DESCRIPTION:

ERDA is a congressionally directed (P.L. 98-212) account to provide visibility for an expanded effort in environmental restoration. It emphasizes the identification, investigation, and prompt cleanup of contamination from hazardous substances and wastes; correction of other environmental damage, such as unexploded ordnance detection and disposal; demolition and removal of unsafe and unsightly buildings and structures; debris removal; and improvements in DOD's hazardous waste operations. This fund covers the following subactivities:

a. Hazardous and Toxic Waste Disposal - This subactivity is a comprehensive program to identify, investigate, and cleanup contamination from hazardous substances and waste. It covers all expenses for hazardous waste disposal, with the exception of the construction of hazardous waste storage, treatment, or disposal facilities. It includes studies and contract support related to hazardous waste disposal.

b. Ordnance and Explosive Waste Removal - The purpose of this subactivity is to plan and execute a program for disposal of ordnance and explosive waste.

c. Building Demolition and Debris Removal - The purpose of this subactivity is to plan and execute a comprehensive program to demolish and remove unsafe, unsightly, and hazardous buildings and structures. Expenses incident to complete restoration, such as restoration of natural resources, are included if such expenses are clearly and directly related to the demolition and debris removal.

MICHAEL J. VAN WAGENEN
ATTORNEY AT LAW
P.O. BOX 30076
SALT LAKE CITY, UT 84130
801/ 977-6346

February 23, 1990

Jude W. P. Patin
Brigadier General
U.S. Army Commanding
536 South Clark St.
Chicago, IL 60605

RE: Granite City Army Depot Railroad Marshaling Yard
Project No. E0SIL056500

Dear General Patin:

Your predecessor, General Theodore Vander Els, issued a Determination on September 26, 1989, based on incorrect information. I have enclosed for your review a copy of the Determination, Findings of Fact and my response to Mr. John P. D'Aniello.

My client, K & S, the owners of the property in question have not been previously contacted concerning this matter and do hereby request that restoration actions be taken. Will you please provide me with directions on how this may be accomplished. Thank you for your assistance.

Very truly yours,

Michael J. Van Wagenen

MJV/js

Enclosures

cc: John P. D'Aniello
MaryAnn Croce LaFaire
Kern W. Schumacher
Morris H. Kulmer

MICHAEL J. VAN WAGENEN
ATTORNEY AT LAW
P.O. BOX 30076
SALT LAKE CITY, UT 84130
801/ 977-6346

February 23, 1990

Mary Ann Croce LaFaire
Community Relations Coord.
Taracorp Site
U.S. EPA (5PA-14)
230 South Dearborn St.
Chicago, IL 60604

RE: NL/Taracorp

Dear Ms. LaFaire:

My client, K & S, is the owner of the former Granite City Army Depot - Railroad Marshaling Yard. They have leased the premises to A & K Railroad Materials, Inc.

The owners were unaware of any inspection of the site, pursuant to the Defense Environmental Restoration Program. The owners request that a complete environmental study be performed at the site and Alternative "H" be used to clean-up any contamination, as modified to include our site.

I have enclosed for your review, our correspondence with Mr. John P. D'Aniello and General Patin. Please contact me for additional clarification of our position. Thank you for your assistance.

Very truly yours,

Michael J. Van Wagenen

MJV/js

cc: John P. D'Aniello
Kern W. Schumacher
Morris H. Kulmer
Phillip Poce
Bob Radinsky

MICHAEL J. VAN WAGENEN
ATTORNEY AT LAW
P.O. BOX 30076
SALT LAKE CITY, UT 84130
801/ 977-6346

February 23, 1990

John P. D'Aniello, P.E.
Chief, Engineering Div.
Department of the Army
Chicago District
Corp. of Engineers
111 North Canal Street
Chicago, IL 60606-7206

RE: Granite City Army Depot Railroad Marshaling Yard
Project No. E0SIL056500

Dear Mr. D'Aniello:

Your letter to Mr. Morris Kulmer providing the Findings of Facts and Determinations, as it relates to the Defense Environmental Restoration Program for Formerly Used Defense Sites, has been directed to me for response to you.

In paragraph 5 of the Findings of Fact (a copy of which is enclosed for your reference), it is stated:

> "The current owners (A & K Railroad Materials, Inc.) were contacted and a site inspection was conducted on 5 May 1988. The owners have not requested remedial actions be undertaken at the site. There is no evidence of unsafe debris, unexploded ordnance, or hazardous or toxic contamination as a result of DOD use of the site."

There are a number of statements that are incorrect and need to be changed. They include:

1) The current owner is K & S, a general partnership who has leased the premises to A & K Railroad Materials, Inc.

2) The current owner has not been contacted nor was it aware of the site inspection on May 5, 1988.

3) The owners hereby request that remedial actions be undertaken at the site.

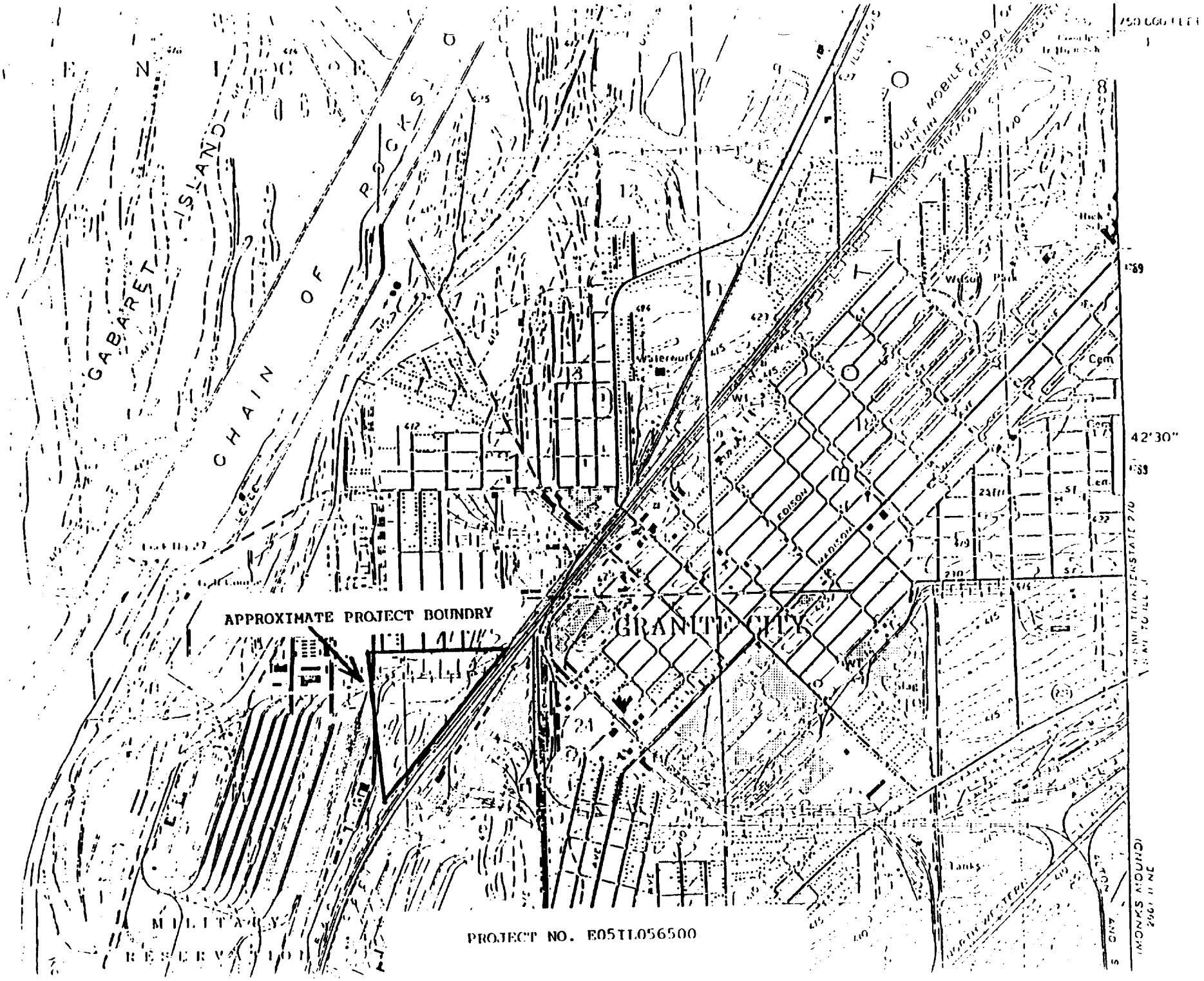
4) The owner has received no evidence that there is an absence of unsafe debris or hazardous or toxic contamination at the site.

I request that you, 1) revise your Findings of Facts and Determinations, 2) complete an environmental study of the site and, 3) complete all necessary restoration actions, in cooperation with K & S. Please contact me for further clarification.

Very truly yours,

Michael J. Van Wagenen

Jude W. Patin
n Croce LaFaire
W. Schumacher
ris H. Kulmer


APPROXIMATE PROJECT BOUNDRY
GRANITE CITY
CHAIN OF ROCKS
GABARET ISLAND
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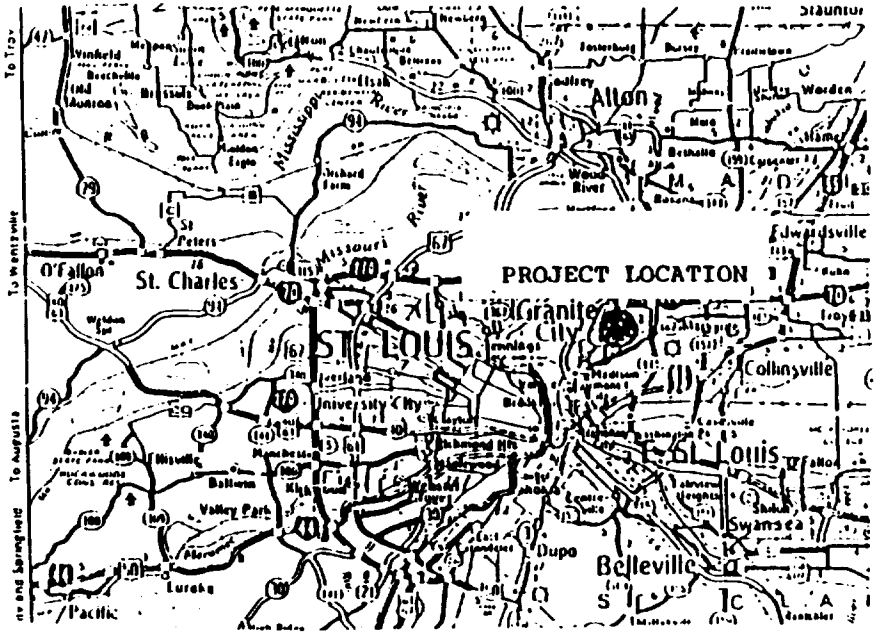

DEFENSE ENVIRONMENTAL RESTORATION
PROGRAM FOR FORMER DEFENSE SITES

PORTION-GRANITE CITY ARMY DEPOT

WILLKIE FARR & GALLAGHER

Washington, DC
New York
London
Paris

March 12, 1990

Mary Ann Croce
Community Relations Coordinator
U.S. Environmental Protection Agency
Office of Public Affairs
230 South Dearborn Street
Chicago, IL 60604

Re: Taracorp Superfund Site/Granite City, Illinois

Dear Ms. Croce:

Enclosed please find NL Industries' Public Comment to be submitted to the record for the Taracorp Site. I would appreciate it if you could date stamp the extra copy indicating your receipt and acceptance for the record and return it to me in the enclosed stamped, self-addressed envelope.

Sincerely,

Bonni Fine Kaufman

Bonni Fine Kaufman
Counsel for NL Industries, Inc.

Enclosures

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1155 21st Street, NW
Washington, DC 20036-3302
202 328 8000

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PUBLIC COMMENTS OF NL INDUSTRIES ON THE PROPOSED PLAN FOR THE TARACORP SUPERFUND SITE, GRANITE CITY, ILLINOIS

Prepared by:

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Swiatoslav Kaczmar, Ph.D., C.I.H.
O'Brien & Gere Engineers, Inc.

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EXHIBIT A

I. INTRODUCTION

NL Industries (NL) submits these comments for the public record for the Taracorp Site, Granite City, Illinois in support of the implementation of Remedial Alternative D. For the reasons set forth in this public comment, Alternative D is the most cost-effective remedy which will protect human health and the environment in accordance with CERCLA. NL will demonstrate that EPA's selection of recommended Remedial Alternative H violates EPA Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund sites and ignores site specific data and risk assessments which support the implementation of the 1,000 ppm clean-up level proposed in Alternative D. Furthermore, it is not justified by available scientific studies relevant to lead exposure and is technically infeasible. Finally, implementation of Alternative H will disrupt the Granite City community, and expose it to unnecessary adverse health, safety and environmental impacts.

Alternative H involves the removal and resodding of lead-bearing soils from a ninety-seven block area in Granite City, one of the largest projects undertaken by the Superfund program. Supporting technical and scientific data for this incredible proposal were not developed during the five-year remedial investigation/feasibility study conducted by NL with IEPA and EPA oversight. Instead, they were released less than two months ago, without review by the Illinois Department of Health or O'Brien & Gere, the engineering firm approved by EPA

and IEPA to investigate the site and propose selected remedial alternatives.

The essential difference between Alternative H and NL's preferred Alternative D is the clean up level for lead-in-soil in residential areas. In general, Alternative H would clean up residential areas with soil lead above 500 ppm, while Alternative D cleans up areas with soil lead above 1,000 ppm. As these comments will demonstrate, the 1,000 ppm level proposed by NL is not only supported by EPA guidance and site specific risk assessment data, it will be fully protective of public health, particularly the health of children, who as a group have been shown to be more sensitive to lead.

Alternative D fully complies with EPA's Interim Guidance on Establishing Soil Lead Clean-up Levels at Superfund sites by employing three valid risk assessment approaches, including a site specific local blood lead study, a modified ADI approach for lead and a soil/blood lead correlation incorporating recent data on lead exposure. In contrast, EPA's Alternative H does not rely on site specific data, but instead on limited vegetable uptake studies irrelevant to Granite City conditions and outdated information on lead exposures. Moreover, the cost and implementation time of Alternative H has been underestimated by EPA and community impacts and technical feasibility concerns have been ignored. EPA's recommendation of Alternative H and arbitrary and capricious rejection of Alternative D without scientific or technical justification

violates the letter and spirit of CERCLA, wasting precious Superfund monies with no additional benefit to the public or environment.

II. THE BACKGROUND AND HISTORY OF NL'S CONDUCT OF THE RI/FS AND PROPOSED REMEDIAL ALTERNATIVE.

NL voluntarily entered into an Administrative Consent Order ("ACO") for conduct of a remedial investigation feasibility study (RI/FS) with EPA and the Illinois Environmental Protection Agency (IEPA) in May, 1985. The ACO scope of work negotiated and agreed to by the parties required NL to undertake a site-specific risk assessment, incorporating previous sampling, blood tests and health studies undertaken at the site.[1]

During the next five years, NL fully complied with the terms of the order, conducting three separate site-specific risk assessments, supervised by U.S. EPA and subjected to peer

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[1] The ACO also required compliance with the EPA Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA. This Guidance provides that:

a. the RI must be tailored to meet site-specific needs;

b. data generated must be evaluated in context of individual nature of the site; and

c. where ARAR's are unavailable, toxicity assessment should be based on reference doses. The weight of the evidence associated with toxicity information is a key element of this risk characterization.

review scrutiny. NL submitted the preliminary feasibility study report in August, 1989. It concluded that a 1510 ppm soil lead level for residential areas was protective of public health and the environment and conservatively used a 1,000 ppm soil lead level to select residential neighborhoods targeted for remediation.

NL received comments from U.S. EPA and IEPA on October 4, 1989, arbitrarily rejecting the previously approved and legally required risk-based approach to remediation of the site. The agencies instead proposed a 500 ppm level for residential soils and a 1,000 ppm level for industrial areas based on their interpretation of U.S. EPA Interim Guidance on Establishing Soil Lead Clean-up Levels at Superfund Sites issued in September, 1989. NL responded to these comments in compliance with the Consent Order on November 10, 1989, but U.S. EPA, without explanation, has refused to enter into dispute resolution to resolve the differences in the two approaches, in direct contravention of Paragraph 17 of the Consent Order.[2]

On January 10, 1990 U.S. EPA further breached the Consent Order by releasing NL's August, 1989 study, with an

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2 Paragraph 17 of the Consent Order required EPA to respond to NL's submittal within thirty days. EPA was further required to enter dispute resolution procedures if it did not approve NL's submittal. As of this date no response has been received and EPA has refused to enter into dispute resolution.

addendum prepared by EPA selecting Remedial Alternative H. As the following comments will show, this arbitrary and capricious rejection of Alternative D is not supported by the evidence.

III. NL'S RECOMMENDED ALTERNATIVE D FULLY COMPLIES WITH EPA'S INTERIM GUIDANCE ON ESTABLISHING SOIL LEAD CLEAN-UP LEVELS.

In September, 1989, after the preliminary feasibility study for the Taracorp site had been completed, EPA Headquarters issued Interim Guidance on Establishing Soil Lead Clean-up Levels at Superfund sites.[3] The Guidance sets forth an interim soil clean up level for total lead in residential areas at 500 to 1,000 ppm, which is adopted from a 1985 Center for Disease Control (CDC) Publication "Preventing Lead Poisoning in Young Children."

The CDC Publication itself does not recommend a clean-up level for lead in soil, however. Based on its review of lead exposure studies, it suggested that "lead in soil and dust appears to be responsible for blood levels in children increasing above background levels when the concentration in soil or dust exceeds 500 to 1,000 ppm." No indication is provided of the background level used or of any potential

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3 EPA's issuance of the Interim Guidance has been challenged by the Atlantic Richfield Company in a suit filed in the United States Court of Appeals for the District of Columbia, on the grounds that EPA failed to comply with notice and comment procedures for rulemaking when it issued the guidance.

occurrence of adverse effects following exposure to soil or dust levels in this range.[4]

Within this framework, the Interim Guidance explicitly provides that "site specific conditions may warrant the use of soil clean-up levels below the 500 ppm level or somewhat above the 1,000 ppm level," providing flexibility on either end of the range. It emphasizes that the Administrative Record supporting the clean-up level should include background documents on the toxicology of lead and information related to site-specific conditions.

EPA has ignored this flexibility inherent in the guidance, however, failing to recognize that a range of clean-up levels from 500 to 1,000 was provided so that site-specific factors may be taken into account. Instead of examining these factors and incorporating them into a proposed clean-up level, EPA seemed to randomly pick a 500 ppm level with no relation to site conditions. It has struggled to articulate the scientific reasons for selecting the 500 ppm level ever since. When compared to the laborious process undertaken by NL to support its 1,000 ppm level, this effort falls far short of EPA's legal responsibilities under CERCLA to

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[4] Review of the CDC document makes clear that it never intended the 500 to 1,000 ppm level to be considered as a "recommendation" and adopted as a soil cleanup level. As the attached comments submitted to Jonathan Z. Cannon by ARCO demonstrate, there is no scientific documentation in the CDC document to support the interim cleanup level. See Exhibit A.

1. The Illinois Department of Health Blood Lead Survey Provides the Best Information on Lead Exposure in the Granite City Community.

As part of its risk assessment, NL reviewed the data from the Illinois Department of Health (DOH) Blood Lead Surveys conducted during 1979 and 1982 summarized in the IEPA report "Study of Lead Pollution in Granite City, Madison and Venice, Illinois, April, 1983." This study, conducted while the Taracorp Smelter facility[6] was still in operation, found that "high absorption of lead is not occurring" in Granite City and there was no "unusual incidence of elevated blood levels."

The DOH blood-lead study provides the best and most relevant information to understand the relationship between lead-bearing soils surrounding the Taracorp site and any health risk to nearby residents from elevated blood-lead levels. EPA summarily rejected the data from this study, however, because it was conducted in November and December, when it believed residents were less likely to be outdoors. Using unreferenced values for blood lead declines, the Agency estimated the peak blood lead might have been 15 to 20% higher if the survey had been conducted in the summer or late fall. The U.S. EPA Review of the National Ambient Air Quality Standards for Lead (1989) cites data indicating that the half-life for clearance of lead from the blood of children is 10 months, however, with a rate

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6 The Smelter facility was identified by IEPA as a major source of lead. It was shut down in 1983 and is no longer operational.

constant of 0.072 per month. Thus, in the absence of any external uptake of lead over the period in question (an obviously theoretical assumption in Granite City or elsewhere in the U.S.), blood lead should decline by only 7.2% per month. In other words, the mean blood lead level of 10 ug/dl reported in the IDPH report for November might have been 12.3 ug/dl in September, if no lead exposure had occurred in the three month period.

The IDPH report also contains data on the levels of free erythrocyte protoporphyrin (FEP) in blood. FEP is formed when zinc is incorporated into heme instead of iron during erthrocyte formation, due to the inhibitory effect of lead on the enzyme ferrochelatase (U.S. EPA 1986). It is a longer term indicator of lead exposure than blood lead, because the life of an erythrocyte is approximately 120 days. Thus, if lead exposure had actually been higher during the summer and early fall months as EPA alleges, FEP concentration should have been elevated during the November/December sampling period. It was not elevated, however, according to the IDPH survey, indicating that the results of the study were a valid indicator of blood lead, even for summer months when outdoor activity may be more frequent.[7]

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7 As IDPH points out in its report, one or two cases of elevated FEP should have been found in a sample of 46 urban children.

Therefore, the Agency's position that summer blood lead values may have been elevated relative to the time of the IDPH survey is incorrect, both because it uses an assumption of no significant exposure to lead over the period between summer and late fall (ignoring ambient exposure sources such as diet, house dust and air), and because FEP levels were not elevated.

Moreover, the blood lead and FEP testing conducted by IDPH indicate that soil lead concentrations in Alternative H's proposed remedial Areas 4-8 were not causing public health risks at that time. Therefore, the need to remediate these areas as proposed under Alternative H is not supported by the public health data.

Although a final report of the 1982 Granite City blood lead survey was never prepared by IDPH, summary tables of the survey were provided by IDPH, which break down data by age, sex, and location for both blood lead and FEP. Data for children aged 1 to 6 in Granite City were extracted for analysis (Exhibit B). Table 1 presents these data for the total 33 childrens' samples provided as a function of sectors of the study area EPA (Figure 4-5). The data show a decreasing trend in lead exposure with increasing distance from the Taracorp site, with mean blood and FEP levels of 17.1 to 33.5 mg/dl and 16.8 to 16.1 mg/dl for Sectors 2 and 3 respectively. Using the most recent guidance available for blood lead exposure parameter of concern (ATSDR 1988) with consideration of a proposed revision for blood lead of 15 mg/dl, none of the

33 children analyzed showed a combination of blood lead exceeding the current or proposed action level for lead exposure.

Furthermore, two predominant sources of lead in the study area - active smelting operations and use of the leaded automobile fuels were present at the time of the IDPH study, but are not present now. As discussed in Section III.A.3. of these comments, U.S. EPA (1989) has reported that the average blood lead levels of children have decreased from 14.9 ug/dl in 1978 to a projected 4.2 to 5.2 ug/dl in 1990. Therefore, blood lead levels of Granite City residents should have substantially decreased since 1982, meaning the values in the study are likely overstated.

2. The ADI Approach is an Acceptable Approach Given O'Brien & Gere's Development of a Modified Reference Dose.

In its comments, EPA criticized the Acceptable Daily Intake (ADI) Approach proposed in NL's risk assessment because the Agency has withdrawn its ADI for chronic exposure (ADIC) for lead. The new Risk Assessment Guidance for the Superfund Human Health Evaluation Manual (HHEM, 1989), however, provides guidance on the derivation of toxicity values even in the absence of EPA-verified values. It is possible to independently generate such values with the approval of the U.S. EPA's Environmental Criteria and Assessment Office (ECAO). As documented in previous correspondence submitted to this

record,[8] such an approach was taken with the Granite City risk assessment, whereby the previous AIC was reduced by 40% in proportion to the anticipated lowering of the CDC level of concern for blood lead from 25 to 15 ug/dl. Dr. Michael Dourson of ECAO concurred that such an approach might be a reasonable alternative until additional guidance is forthcoming from the Agency.

The Agencies rejected the ADI approach, however, for Granite City, presumably because it assumes thresholds for lead. Such rejection may be based on the implied conclusion that there is no threshold effect level for lead in children, a position that is unsupported by the record or scientific principles. For example, a lowest observed adverse effect level (blood concentration) for lead in humans is cited by Madhavan et al. (1989) as 10 ug/dl (p. 137) because this level was the lowest associated with the inhibition of the enzyme ALAD (delta-aminolevulinic acid dehydrase), a key enzyme in the biosynthesis of heme. However, this inhibition is translated into decreased hemoglobin levels and anemia only at substantially higher blood lead levels -- 40 to 80 ug/dl -- based on a number of investigations reviewed in the ATSDR

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8 See December 16, 1988 letter to Mr. Brad Bradley and Mr. Ken M. Miller from Bonni Fine Kaufman, with attachments.

Toxicological Profile for Lead (draft 1988).[9] Thus, ALAD inhibition at 10 ug/dl should be viewed as a biological indicator of lead exposure, rather than an overt adverse effect. Given the existence of an appropriate threshold effect level of 25 ug/dl for lead or a proposed level of 15 ug/dl, the ADI approach is a valid method of risk assessment, supporting NL's proposed 1,000 ppm clean-up standard.

3. The Soil/Blood Lead Slope Proposed in NL's Risk Assessment is Consistent with Recent Studies of Lead Exposures As Well As Recent EPA Air Policy.

A critical review of post-1980 information on lead exposure indicates substantial decreases in baseline lead exposure, due primarily to the phasedown in leaded fuels and other lead uses. Since this phasedown beginning in the mid-1970's, there has been a dramatic decrease in the blood lead content of the United States population, as well as an apparently lower contribution of soil lead residues to blood lead content. As explained below, these contemporary data are more relevant to the remediation of the Taracorp site than the older studies relied upon by EPA and provide ample basis for the risk assessment's soil/blood lead slope.

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9 This would appear to be due at least in part to the observation that approximately 90% or more of ALAD activity can be lost without measurable effect on the rate of heme synthesis (O'Flaherty 1981, p. 287).

The original risk assessment for Granite City uses a soil/blood lead slope of 2 ug/dl lead per 1,000 ppm increase in blood lead. This slope was based on the analysis presented in EPA'S Air Quality Criteria for Lead (1986), which suggested that a slope of 2.0 ug/dl per 1,000 ppm soil lead may represent a reasonable median estimate for a soil/blood lead slope. Three recent empirical studies, Stark et al. (1982), Rabinowitz and Bellinger (1988), and Johnson and Wijnberg (1988) indicate that the relationship between blood lead concentrations and soil lead ranges from 0.6 to 1.8 ug/dl per 1000 ppm, indicating that 1,000 pm will be protective of public health at the Taracorp site.

First, Stark et al. (1982), conducted a study of the exposure of urban children to soil lead from 1974 to 1979 in New Haven, Connecticut using 153 children of age 0 to 1 year, and 334 children of 2 to 3 years, and soil ranging in lead content from 30 to over 7,000 ppm. An analysis in U.S. EPA's Air Quality Criteria For Lead (1986) of the data in this study gave a slope estimate of 1.8 ug/dl blood lead per 1,000 ppm soil lead. U.S. EPA identified this slope as a good median estimate of the relationship between soil and children's blood lead. It has been incorporated into the Granite City/Taracorp risk assessment slope of 2 ug/dl blood level per 1,000 ppm soil lead.

Second, Rabinowitz and Bellinger (1988) conducted a study similar to Stark et al. of a population of children in

Boston during 1981. The study used a sample size of 195 children aged 6 months to 24 months and a range of soil lead of 7 to 13,240 ppm. The population was divided approximately evenly into populations of children with more mouthing activity and those who were said to finger and hand mouth less, which was determined by a statistical analysis of psychologists' judgments on the frequency with which the children placed their fingers, hands, or foreign objects in their mouths. (This distinction is important as high hand to mouth activity may lead to relatively higher exposure to soil and dust lead residues.) The slope estimate for the less mouthing group was 0.57 ug/dl per 1,000 ppm (standard error of 0.2), and 1.6 ug/dl per 1,000 ppm of lead (standard error of 0.5) for the greater mouthing group,[10] once again less conservative than the 2 ug/dl per 1,000 ppm slope in the NL risk assessment.

Third, Johnson and Wijnberg (1988) conducted a study commissioned by the Centers for Disease Control in 1983 of children living in the vicinity of the ASARCO lead smelter in East Helena, Idaho. These investigators derived a slope

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10 Because the study population did not live in crowded conditions which might enhance exposure to leaded paint residues in soil near houses, the authors caution that the slope might be steeper under more crowded, urban environmental conditions.

estimate of 1.4 ug/dl per 1,000 ppm lead, with a soil range of 158 to 1,549 ppm studied.[11]

These recent studies, taken as a whole, show that the contribution of soil lead to children's blood lead may be substantially less than originally thought, validating the 2 ug/dl per 1,000 ppm slope used in NL's risk assessment.

Moreover, as reviewed and documented in the U.S. EPA Review of the National Ambient Air Quality Standards for Lead (1989), general lead exposures have been declining rapidly, not only because of the phasedown of leaded gasoline, but also due to the elimination of the use of leaded solders in metal food containers and the replacement of water distribution systems containing leaded solders. For example, estimates of mean dietary lead exposure in children was reported to have decreased from 52 ug/day to 8.8 ug/day between 1978 and 1990 (p. C-9). The U.S. EPA Review of the NAAQS for Lead (1989) was reviewed and approved by the U.S. EPA Clean Air Scientific Advisory Committee which estimated, through the use of a validated biokinetic lead exposure model and the 1978 NHANES II blood lead data, decreases in children's blood lead due to phasedown of leaded gasoline of 8.6 ug/dl, decreases in blood

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11 The data of Johnson and Wijnberg (1988) were also used by U.S. EPA (1989) to successfully validate its mathematical biokinetic model predicting blood lead levels in various age groups based on uptake, absorption and elimination rates via several physiological compartments and exposure routes.

lead due to decreased dietary lead exposure of 0.9 to 1.8 ug/dl, and decreases in maternal lead exposure producing decreased blood lead of 0.2 to 0.3 ug/dl. As a result, blood lead levels of 2 year old children in 1990 should average (geometric mean) from 4.2 to 5.2 ug/dl (compared with the average 1978 value of 14.9 ug/dl), and also from 3.5 to 5.8 ug/dl in adults (down from average values of 10.8 to 17.7 ug/dl) (see Table C-5, U.S. EPA 1989). These values, combined with the lower contribution from soil lead, and the fact that the IDOH blood lead study showed that residents of Granite City do not have elevated blood lead levels, indicate that the 1,000 ppm clean-up standard in Granite City will be fully protective of public health.

IV. THE INFORMATION CITED BY EPA TO SUPPORT A 500 PPM CLEAN-UP LEVEL IS IRRELEVANT TO GRANITE CITY CONDITIONS AND RELIES ON OUTDATED INFORMATION.

To support its preferred Alternative D, NL developed a three-pronged site specific risk assessment which has been updated by detailed information presented in these comments. In contrast, to justify its selection of Alternative H, EPA has relied on two generic vegetable uptake studies, an analysis of an outdated data set on lead exposure and a Superfund Record of Decision.[12] Upon review, it is readily apparent that these

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12 EPA has also referenced a draft ATSDR risk assessment of the Taracorp site. The ATSDR did not undertake a site-specific risk assessment for lead, however, it simply referenced the CDC guidance.

studies and the United Lead Scrap Record of Decision are completely irrelevant to conditions at the Taracorp site and do not provide a basis for a 500 ppm clean-up level. In fact, if the data in these studies are applied correctly, they support the 1,000 ppm level proposed in Alternative D.

A. The Results Of The Vegetable Uptake Studies Are Not Appropriately Applied To Granite City.

The first two studies relied upon by EPA, (Spittler and Feder 1979) and (Bassuk, 1986) examine vegetable uptake of lead and the methods to reduce such uptake. The Study of Lead Pollution in Granite City, Madison and Venice, Illinois conducted by IEPA in 1983, however, concluded that garden vegetables grown in the vicinity of the smelter do not appear to pose a significant risk. This site specific data should clearly take precedence over two generic vegetable studies that have no relation to Granite City soil conditions.

The IEPA study (1983) surveyed a variety a vegetables grown in Granite City gardens. As reported on page 37 of the study, vegetables grown in soils containing 53 to 97 ppm lead showed mean wet weight concentrations of 0.009 ppm, compared with 0.17 ppm for crops grown in soils of 1,100 to 1,500 ppm lead. In contrast, lettuce raised under greenhouse conditions by Spittler and Feder (1979) in 1,000 ppm soil lead contained approximately 3.1 ppm total lead (wet weight), almost 20-fold higher than the measured Granite City samples. Combining these data with an analysis of the dietary contribution of home-grown

vegetables, and consideration of the limited extent of vegetable gardening in Granite City, IEPA (1983, pp. 38 and 48) concluded that vegetables did "... not appear to pose a significant risk as long as they are thoroughly washed before eating."(p. 48). Therefore, as will be shown below, the results of the Bassuk and Spittler and Feder studies are completely irrelevant to the derivation of soil lead remedial objectives for the Taracorp site.

1. The Bassuk Study.

The purpose of the Bassuk Study was to determine the effect of the phosphorus content in soil on lead uptake in plants as a function of soil lead concentration. The study used a soluble lead compound, $PbCl_2$, to determine lead uptake by lettuce.[13] In contrast, as stated on page 54 of the RI report, due to their smelting operation origin, the soil lead compounds at the Granite City site are likely to be oxides, sulfides, and mixed oxide/sulfates which are insoluble in water (Budavari 1989). Their insoluability is also indicated by the negative EP TOX results in the RI/FS from a soil sample with a total lead concentration of 3110 mg/kg (dry weight) (page 35 of the RI report).

Metal uptake by plants is directly proportional to the solubility of the metals in soil (Logan and Chaney 1983). Due

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13 The aqueous solubility of $PbCl_2$ is 9.9 g/L at 20/C (Weast 1973), making it a relatively soluble lead compound.

to their relatively low water solubilities, the uptake by lettuce of the lead compounds at the Granite City site will be lower than in the Bassuk study where $PbCl_2$ was used. The extent of lead uptake by lettuce plants determined using the more soluble $PbCl_2$ cannot therefore be used as a measure of uptake of the relatively insoluble Granite City site lead compounds.

Moreover, no data were provided in the Bassuk study on the simple relationship between soil lead concentration and the extent of lead uptake by the lettuce. All the data are concerned with the effect of phosphorus on this relationship. What would have been more relevant to the site would have been a determination of the relationship between lead in soil and lead uptake unconfounded by the added factor of the phosphorus. To ignore the effect of phosphorus and simply apply the data to the site as a guide to the relationship between soil lead concentration and plant uptake is not scientifically valid.

Finally, nowhere in the Bassuk study are there any data to support selection of 500 ppm lead in soil as an acceptable remedial level based on agricultural or other land use. In fact, the data provide no basis for differentiating between 500 ppm and 1,000 ppm soil lead remedial objectives based upon lettuce uptake.

2. The Spittler and Feder Study.

The Spittler and Feder (1979) study similarily cannot be used as a valid basis for setting Granite City site clean-up objectives. The study was designed to determine the relationship between lead uptake by various common garden plants and the concentration of lead in urban soils. While the results clearly show the dependence of lead uptake on soil lead concentrations under the study conditions, the design of this experiment makes it of questionable relevance to the Granite City site. Moreover, the failure to document study conditions which would increase the bioavailability of the lead studied means the results cannot appropriately be applied to Granite City.

The major problem with the Spittler and Feder study is that it was conducted in a greenhouse rather than a field setting. It has been shown that the uptake of certain metals such as Zn, Cd, and Mn by plants is up to 5 times higher in greenhouse studies than in field studies (Logan and Chaney 1983). It is probable that lead is also subject to this phenomenon and the amount of lead actually observed in the field (i.e. garden) would be expected to be lower than observed in the Spittler and Feder greenhouse study.

This "greenhouse effect" is the result of several factors. First, the use of NH_4-N fertilizers in pots in the greenhouse has the effect of lowering the pH of the soil directly adjacent to the plant roots. This results in higher

metal solubility, and consequently greater bioavailability (Logan and Chaney 1983). Abnormal watering patterns and the relative humidity of a greenhouse contribute to this effect. In contrast, the maximum growth rates achieved within a greenhouse cannot be achieved in Granite City because such conditions do not exist naturally. Therefore, lead uptake in Granite City vegetables will be lower.

The description of study procedures presented in Spittler and Feder was clearly inadequate to determine whether the conditions responsible for the greenhouse effect were present. Consequently, the study results are not likely characteristic of growth conditions in a typical urban garden, but of greenhouse conditions that would result in higher uptake levels. Without specific details on study conditions, it is improper to rely on these data to predict garden vegetable lead uptake levels.

Moreover, several additional factors important for the determination of the bioavailability of lead in soil were not addressed in the study. The most important of these factors is the pH of the soil. As the soil pH decreases, the solubility of metal compounds typically increases, causing an increase in bioavailability (Logan and Chaney 1983). No soil pH data were given in the study. Without such data, it is not possible to use the study to predict the extent of lead uptake by plants in other areas, including Granite City.

As the Bassuk (1986) study demonstrated, the concentration of phosphorus in the soil also has a pronounced effect on the extent of lead uptake by lettuce. Specifically, as the concentration of phosphorus in soil rises, the amount of lead taken up by lettuce decreases. Since Spittler and Feder (1979) did not measure the phosphorus concentration of the soils used to conduct their study, it is not possible to determine how widely applicable their data are. This is a particularly critical point, because serious vegetable gardeners routinely amend their soils with organic and inorganic fertilizers, mulches, and other additives, the majority of which would act to reduce lead solubility and plant uptake.

The study also fails to analyze the nature of the lead compounds that were accumulated from the soil by the crops. The lead compounds at the NL Granite City site are relatively insoluble, having been weathered in the years since their original release as a result of smelting operations. The lead compounds contained in the soils used by Spittler and Feder were likely derived from lead paints and auto exhaust. In the case of auto exhaust at least, the lead compounds are likely halides and mixed lead halide/ammonium halide double salts (U.S. EPA 1986), which will be much more soluble than the NL Granite City site lead compounds (Budavari 1989), and therefore have greater bioavailability.

The final problem with EPA's reliance on this study is that the study contains absolutely no rationale or support for selecting the 1000 ppm and 500 ppm advisory soil lead levels. These guidelines were simply stated to have been recommended to the Boston Gardening Community. There was no assessment of the risks that pertain to such soil lead levels and they were presented without derivation. Based on the lack of substantiation for the selection of these levels, and the fact that the experiment conditions under which the study was conducted were not similar to conditions at the Granite City site, the use of this study to set lead clean-up levels for Granite City is clearly not supported by the data presented. The obvious conclusion is that the IEPA study of the Granite City garden vegetables is a more appropriate site-specific site evaluation of lead uptake in Granite City vegetable gardens.

a. Application of the Spittler and Feder results to Granite City shows no increase in lead exposure.

Even if one were to accept Spittler and Feder's uptake calculations for lettuce and other vegetables, which is clearly not recommended, the following calculations show that the resultant blood lead increase projected by the study for Granite City residents is not of concern. Spittler and Feder's study shows that lettuce grown in greenhouse conditions in Boston garden soil at 1,000 ppm lead contained 55 ppm dry weight, and 3.14 ppm wet weight. Values for 500 ppm were 30

ppm dry weight, and 1.71 ppm wet weight. Values for radish tops (a possible surrogate for other vegetable types) were approximately 50% of the lettuce values, and radish root even less. The EPA Exposure Factors Handbook (EFH 1989) summarizes adult dietary intakes as 200 g per day of total vegetable consumption, 40 g of which are lettuce. The handbook also presents a reasonable worst case, whereby 80 g per day of vegetables are homegrown over 50% of the year, or 40 g per day on a yearlong basis (10 g as lettuce). Thus, for a garden plot containing 1,000 ppm soil lead, the increase in blood lead due to consumption of the garden vegetables is as follows:

	ppm fresh weight	ug Pb/ingested/day	increase blood Pb*
lettuce	3.1	31	0.99
other vegetables	1.5	45	1.44
Total		76	2.33

* U.S. EPA (1989): blood lead increases 0.032 ug/dl per ug lead ingested for adults

The increase at a corresponding 500 ppm soil lead would be approximately 1.2 ug/dl.

It is not probable that young (ca. 2 year old) children would consume fresh vegetables at these rates. A 7 kg child (10% adult weight) who did so proportionally on a body weight basis would ingest 7.6 ug lead per day, and absorb 3.8 ug approximately. The children's relationship between absorbed lead and blood lead is 0.38 ug/dl per ug absorbed (also from the U.S. EPA (1989) OAQPS biokinetic model) or 1.4 ug/dl blood

lead increase at 1,000 ppm soil lead and 0.7 ug/dl at 500 ppm. In the context of projected baseline blood lead of 5 ug/dl and the exaggeration of lead/plant uptake by the Spittler and Feder study design, these estimated increases in blood lead are of no concern. Therefore, neither the study nor its predicted impact in Granite City provides a basis for a 500 ppm soil lead clean-up standard.

B. The Madhavan Study Is Drawn From A Biased Sample Of Outdated Studies And Does Not Support EPA's Clean-Up Standard.

The third study, (Madhavan, Rosenman & Shehata) cited by EPA to support Alternative H relies entirely upon older, pre-1975 data on lead exposures and ignores more recent data suggesting that the contribution of soil lead to children's blood lead may be substantially lower than originally thought. As discussed in the preceding section, downward trends in the level of lead exposure in the United States render the Madhavan conclusions of questionable contemporary significance. In addition, the study selection method used by Madhavan et al. was biased and used an invalid data point.

Madhavan et al. used a compilation of studies on blood lead and soil exposure conducted primarily before 1975 contained in Duggan (1980). In Duggan's analysis of the available literature, 21 blood lead/soil and/or dust lead correlation studies were listed, with correlation slopes for the contribution of soil and/or house dust lead, ranging from

1.6 to 14 ug/dl per 1000 ppm soil lead (some of which represent averages of replicate studies within a single cited source). Duggan (1980) selected 19 of these values which showed a statistically significant difference in the range of soil lead concentrations measured, and derived an estimated increase (both arithmetic mean and median) of the order of 5 ug/dl per 1000 ppm of soil or dust lead (p. 316).

Madhavan et al. selected only 8 of the 21 individual blood lead/soil lead correlation estimates, ranging from 0.6 to 65.0 ug/dl per 1000 ppm, from the Duggan compilation for their analysis. The intent was to isolate uptake in children less than 12 years of age ("... the most susceptible group to lead toxicity"...) and to eliminate the influence of other sources of lead exposure (house dust was cited, p. 138). No other justification was provided for the selection of these eight values. In fact, Duggan (1980, p. 312) notes that there was no clear separation of the slope values seen in soil studies vs. house dust studies. This opinion was confirmed by U.S. EPA (1989). Thus, the basis for study selection in the Madhavan et al. analysis is questionable, particularly the exclusion of house dust studies because these studies would include lead from the soils as well. This diminishes the statistical confidence of the resulting estimate of slope.

Madhavan et al. also determined a geometric mean (based on an assumption of lognormal blood lead distribution) for the 8 studies taken from Duggan (1980) of 3.41 ug/dl per

1000 ppm soil lead with a geometric error of 1.75 ug/dl. An upper bound 95% confidence limit of 8.5877 ug/dl per 1000 ppm is reported. Examination of the table in Duggan (p. 313) from which the 65.0 ug/dl per 1000 ppm value (from the Angle et al. reference) was selected by Madhavan indicates that the soil lead residue range was considerably less than 1000 ppm (97 to 219 ppm), and that the variation was not considered statistically significant. Thus, this value cannot be considered a "slope" describing the incremental contribution of increasing levels of soil lead to blood lead, as mistakenly represented by Madhavan et al. (p. 139, Table 1). It represents only an estimate of blood lead obtained by extrapolation from a single soil lead level typical of urban background levels, and measured blood lead levels of 14 to 22 ug/dl, to a hypothetical soil lead level of 1000 ppm.

Derivation of a valid correlation slope requires that the independent variable(s) be measured over a statistically significant range of values, encompassing the entire range of interest. It is therefore inappropriate to include the value of 65.0 ug/dl per 1000 ppm in the statistical treatment of estimated slopes, because it is not a slope. Neither Duggan (1980, p. 316) nor U.S. EPA (1986) included this value in their analyses of soil lead uptake in children. Furthermore, 65 ug/dl of children's blood lead represents a potential effect level for lead toxicity in children for effects including anemia and neurotoxicity (ATSDR 1988, CDC 1985). Such readily

observed toxicity indicated in Madhavan et al. to be associated with soil lead levels of 1000 ppm is not consistent with public health investigations conducted in Granite City (as reviewed in the Granite City RI report), which did not reveal elevated lead exposure. Nor is it consistent with clinical manifestations of toxicity noted in other reviews, including CDC (1985) and EPA Air Quality Criteria for Lead (1986).

Excluding the highest value in the Madhavan et al. (1989) data set from the calculation (65.0 ug/dl per 1,000 ppm), reduces the 95% upper confidence estimate of the slope to 4.52 ug/dl (Madhavan et al. 1989, p. 140)). This would correspondingly increase the maximum permissible soil lead level derived by the Madhavan et al. (1989, p. 140) approach to 1200 ppm, rather than the 600 ppm level proposed in the study. This soil lead level is clearly inconsistent with the 500 ppm level proposed by EPA.

The Madhavan study has also erroneously assumed that lead uptake is linear with concentration to reach their proposed 600 ppm level. Madhavan et al. presents a table which assumes a linear relationship between blood lead and soil lead down to a slope of 1 ug/dl per 116 ppm soil lead. The basis for this assumption of linearity, however, is not provided. In fact, in citing the Centers for Disease Control (CDC, 1985) review of some of the same information utilized by Duggan (1980), Madhavan et al. appear to contradict their own assumption of linear uptake. Specifically, CDC concludes: "In

general, lead in soil and dust appears to be responsible for blood lead levels in children increasing above background level when the concentration in the soil or dust exceeds 500-1000 ppm." This statement clearly suggests that soil lead of less than the 500 to 1000 ppm range does not result in observable blood lead increases.

Choosing 5 ug/dl as a "tolerable" level of blood lead to be added to baseline blood lead, Madhavan et al.(1989, p. 140) present the associated value of 600 ppm of soil lead from their linear analysis as a protective level, adding the 5 ug/dl incremental blood lead increase to 1976 - 1980 baseline blood lead medians of 16 and 20 ug/dl. Since the U.S. EPA Review of the NAAQS for Lead (1989) determined that 1990 blood lead values in children should be of the order of 5 ug/dl (p. C-14) the 600 ppm level is obviously significantly overprotective.

1. A correct analysis of the Madhaven data supports the 1,000 ppm clean-up standard.

Utilizing data from Stark et al. (1982) and Rabinowitz and Bellinger (1989), further supported by the CDC's ASARCO study (Johnson and Wijnberg 1988), as well as estimates of current base-line lead exposure, it is possible to utilize the approach of Madhavan et al. to derive an alternative clean-up objective for soil lead in Granite City based on more contemporary data.

[redacted]

Rounding the slope of the Stark et al. (1982) and the Rabinowitz and Bellinger (1988) high mouthing behavior study group to 2.0 ug/dl per 1,000 ppm lead, and adding 1.0 ug/dl (two standard errors on the geometric mean of the Rabinowitz and Bellinger (1988) study), it appears that exposure of a child with high hand to mouth behavior to soil lead levels of the order of 1,000 ppm will add approximately 3.0 ug/dl to baseline blood lead as an upper bound estimate using contemporary data.[14] In view of recent projections (U.S. EPA 1989) that the national mean baseline blood lead concentration in young children may be up to 5.2 ug/dl (geometric mean), an upper bound estimate of childrens' blood lead resulting from exposure to 1,000 ppm soil lead appears of the order of 8.2 ug/dl. This level is below the blood lead level of 10 ug/dl incorrectly cited by Madhavan et al. (1989) as a lowest observed adverse effect level based on ALAD inhibition, and

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[14] Madhavan states that data on estimates of the amount of soil ingested by children show a 100-fold variation and thus are not useful in deriving a "safe" soil level for lead. Therefore, Madhavan et al. use information only on the relationship between blood lead concentration and soil concentration to derive their criterion. However, the sources cited by Madhavan et al. (1989) show good consistency in estimated soil ingestion rates (EFH, 1989). Both the Binder et al. (1986) and Clausing et al. (1987) studies directly measured children's soil ingestion in controlled experiments, and show less than a two-fold variation in mean daily soil ingestion rate (127 - 230 mg/day). Thus, an additional approach to lead exposure analysis was rejected incorrectly, even though U.S. EPA (1989) successfully used such an approach in developing its validated biokinetic lead exposure model.

considerably less than the 25 ug/dl represented by these authors to result from exposure to the 600 ppm maximum permissible soil lead level under the worst case conditions presented in that study.

A margin of uncertainty of approximately 2 ug/dl or more thus exists between the upper bound blood lead estimate of 8.2 ug/dl for exposure to 1,000 ppm soil lead and the Madhaven et al. 10 ug/dl lowest observed effect level for ALAD inhibition. This will allow for protection of site-exposed individuals who are at the upper end of both the 1990 baseline blood lead distribution (estimates of the geometric standard deviation were not available for the current mean estimate but are most likely to be less than the 1978 value of 1.4) and soil lead uptake distribution from overt lead toxicity (as opposed to ALAD inhibition alone). In consideration of the fact that the baseline blood lead already contains a contribution from baseline soil exposure of approximately 1 to 1.5 ug/dl from background soil lead of 180 ppm (calculated from Table 4-2, U.S. EPA 1989), the 1,000 ppm soil lead residues at the Taracorp/Granite City site will not represent a source of adverse health effects for the worst case exposure population.

C. The Cincinnati Work Plan Cited By EPA As Support For Its 500 ppm Level Also Has No Bearing On Granite City Conditions.

EPA has also cited the Cincinnati Soil Lead Abatement Work Plan as support for Alternative H. The Work Plan was

developed as part of the Cincinnati Soil Lead Abatement Demonstration Project, one of three such projects authorized by Section III(b) of SARA, which provides for: "a pilot program for removal [and] decontamination ... with respect to lead-contaminated soil in ... metropolitan areas." See generally Clark, et al., "The Cincinnati Soil-Lead Abatement Demonstration Project" (1989).

EPA's reliance on a lead-in-soil level used in a pilot program as authority for the selection of a cleanup objective for a National Priority List site is misplaced. The scientists carrying out the pilot study design their experiment to suit their hypotheses, and are free to do so with no regulatory, statutory, or other legal constraints. They could choose to examine the impact of absolutely any level of lead-in-soil. In contrast, in selecting a remedy for the Taracorp/Granite City site, the EPA must comply with the National Contingency Plan, Section 121 of SARA and the Consent Order.

Moreover, the Cincinnati project is designed as a research program to address several questions, first and foremost: "Does soil lead and exterior dust abatement in rehabilitated [lead paint-free] housing ... result in a statistically significant reduction in blood lead of children relative to children ... in a control area...?" Clark, at 292. The researchers would be inclined to abate lead-in-soil to a relatively low level, to insure that there will be a real statistically significant difference between the experimental

and control groups. It does not follow at all that the pilot program cleanup level should be applied to Superfund sites. To the contrary, funding of the pilot program may indicate Congressional awareness of the need for research in this field, and the lack of scientifically established remedial references.

Even if the Cincinnati work plan cleanup were carried out in Granite City, it does not go as far as Alternative H. The excerpts from the Cincinnati Work Plan state that the study areas selected had "the presence of a minimum [undefined] number of children under four years of age and the presence of lead contaminated soil" (p. 4-27). Thus, unlike Alternative H, which proposes a universal cleanup without reference to a protected population, the Cincinnati pilot program targets children under four years old. No such differentiation among affected residents has been proposed in Alternative H, indicating a substantial degree of overprotection at an extremely high cost.

D. EPA's Reliance On Other Records Of Decision To Select A Cleanup Level For The Taracorp Site Contravenes The Interim Guidance And Is Scientifically Inappropriate.

The purpose of the Interim Guidance is to require a site-specific analysis for selection of a clean-up level. EPA's asserted reliance on other Superfund Records of Decision (RODs) to select a clean-up level for Granite City not only contravenes this policy, but leads to an absurd result. This is obvious when the United Scrap Lead ROD is carefully analyzed.

The United Scrap Lead site only required removal of 1600 cubic yards of soil to achieve a 500 ppm level. In contrast, Alternative H would require removal of approximately 160,000 cubic yards of soil, resulting in adverse impacts to the community which were never considered at the United Scrap Lead Site. Moreover, since the United Scrap Lead site is located in a rural area, any adverse impacts from excavation and disposal of soils on the population would be minor, as opposed to Granite City, where the area to be remediated is densely populated. The United Scrap Lead site had additional pathways of potential exposure as well, via surface water and groundwater, which are not present in Granite City. Clearly, EPA's reliance on this ROD to support its 500 ppm clean-up level falls short of any reasonable scientific justification.

V. ALTERNATIVE H IS NEITHER COST EFFECTIVE NOR TECHNICALLY FEASIBLE.

EPA's premature release of Alternative H prevented O'Brien & Gere, the engineers approved under the Consent Order, and the persons with the most knowledge and expertise about site from finalizing the feasibility study. Therefore, cost and technical data supporting EPA's proposed Alternative H were not analyzed by O'Brien & Gere before they were released to the public. As a result, the cost of Alternative H and time period for implementation have been significantly underestimated by EPA and technical roadblocks to implementing this Alternative were completely overlooked.

EPA's fact sheet on clean-up alternatives estimates that the total cost for implementing Alternative H is $25 million. The implementation time is proposed to be 1.5 to 2.5 years. The actual cost of Alternative H will be close to $30 million with an implementation time of 7 years. In contrast, Alternative D is estimated to cost $6.8 million with an implementation time of 1 to 2 years.

The assumptions and methods used by NL to calculate the actual cost and implementation time for Alternative H are explained below.

A. Cost Estimate.

To determine the impact of adding the additional residential properties to the remediation area proposed in Alternative H, each block identified by the USEPA was evaluated by O'Brien & Gere. Aerial photographs taken during 1988 were generated at approximately 100 scale and the area occupied by each block (curb to curb) was calculated. In addition, estimates were made on the amount of unpaved surface on residential lots or alleys adjoining those lots. Exhibit C presents a Figure with the numbered blocks as well as a Table which includes the estimated unpaved residential surface area targeted for remediation.

The estimated cost of $30 million assumes a pavement to sod ratio of 1:2 to reflect the residential driveways and the unpaved alleys through the middle of many blocks. The unit

costs for excavation were based on excavation of 50% of the material by small equipment (Bobcat or equivalent) and 50% manually. A drive-by survey of the targeted areas suggests that the teaming of laborers with a light piece of equipment is the method the contractor would use. The combined excavation cost derived from Means 1989 Site Work Construction Cost guide (Means) averaged $31/CY. For the purposes of the Feasibility Study a combined cost of $45/CY was presented. The incremental cost was added to reflect reduced production resulting from tight working conditions associated with minimizing damage to property and shrubs, as well as anticipated supplemental safety requirements. Restoration costs were based on site specific information and unit costs included in Means (see Exhibit D).

Exhibit D presents the detailed cost estimate for Alternative H using the same presentation format that was used in the Preliminary Draft Feasibility Study. The total estimated cost of $30 million prepared using these methods is approximately 20% higher than the EPA's published value. The difference in costs is due to the methods utilized to estimate areas for remediation. O'Brien and Gere conducted a block by block tabulation of the area from aerial photographs while EPA simply scaled up the costs developed by O'Brien & Gere for Alternative D. In addition, EPA's estimate does not appear to include costs for remediating unpaved alleys and sidewalks in residential areas. Although a 20% deviation in costs during the Feasibility Study is within the range expected at this

stage in the project, the actual difference of $5 million is substantial. For budget purposes a $30 million value is considered more appropriate than the $25 million value proposed by the U.S. EPA.[15]

B. Implementation Time.

The USEPA's fact sheet estimated that the implementation of Alternative H would require 1.5-2.5 years. Prior to the Public Hearing, calculations were conducted to provide an indication of project duration. Those calculations resulted in approximately seven years from authorization to begin design to contract closeout. The project duration can be separated into three phases: design, excavation/transport, and installation of the Taracorp Pile cover.

1. Design.

Final design will require supplemental sampling of each of the residential properties according to EPA comments at the February 9, 1990 public hearing. The areas to be evaluated include somewhat in excess of 1600 residences based on the aerial survey. Obtaining access for sampling, sampling, analyses, data validation and reporting is expected to take at least six months. Preparation of design documents, bid

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15 The $30 million figure does not include any additional monies necessary to purchase additional property for the expansion of the Taracorp pile proposed in Alternative H. See Section V, D.

preparation, contractor selection and award is expected to take an additional six months. This results in a one year design process.

2. Excavation/Transport.

The excavation and transport of approximately 160,000 cubic yards of soil to the Taracorp Pile is the major component of this project. Movement of SLLR piles and the removal of contained lead bearing wastes to recycling facilities are expected to require a short period of time and be able to be conducted simultaneously with other activities. Therefore, these activities were not factored into the estimated time frame.

A preliminary time estimate was prepared prior to the February 8 public meeting, by evaluating the production of a work crew consisting of four laborers, and an equipment operator using production rates quoted in Means. The results suggested that each residential property might require 5 days to complete the excavation of 6 inches of soil, replacement of 6 inches of soil, sodding/paving, and the replacement of shrubs as well as other incidentals. NL Industries' experience with similar cleanups suggests that the actual time might be closer to six days/residence. For preliminary estimating purposes a value of 5.5 was used. Remediation of 1690 estimated properties results in 9300 work days for a single crew. This is equivalent to 53 years when corrected for a five day work

week, 50 week work years, and 70% of the work days suitable for construction (reasonable weather conditions).

While sequence of construction will be determined by the contractor, for an initial estimate it was assumed that a particular work crew would have responsibility for both excavation and restoration of a given property. Each crew could send an estimated three truckloads of soil to the Taracorp pile/day during the 3.5 days estimated for excavation at each property. Using a round trip time of 1 hour between arrival at the residence for soil pickup and return to a residence for soil pickup results in eight 10 CY loads per day. Therefore, a truck could service three crews during excavation.

The number of crews which could work simultaneously may be limited by Granite City and would also be limited by truck access to the Taracorp Pile. Concerns raised at the public hearing suggest that vehicles leaving the Taracorp site will likely have to go through sufficient decontamination to prevent tires from tracking dust throughout the city. It was assumed that the time required to enter, dump, decontaminate, and leave the Taracorp site was 20 minutes. Using the staging/decontamination locations limits truck traffic to 48 loads per day. This traffic loading would allow a maximum of 16 crews to be excavating at any given time. Because the loading and unloading is unlikely to be perfectly scheduled, it was assumed that the contractor would elect to use twelve crews and thus minimize truck waiting time at the pile.

Applying twelve five man crews to the project supported by four full time trucks, resulted in an estimated residential excavation time of 53/12 or 4.4 years. Additional time will be required to excavate material from the alleys in Venice Township and Eagle Park Acres. Based on these calculations, an excavation/restoration period of 5 years was estimated.[16]

3. Installation of the Cap.

The time required to cap and close the pile after the soil transport is completed is estimated at one year. This time frame would include finish grading of the pile, installation of the two foot clay barrier, the synthetic membrane, drainage layer, filter fabric, root zone, and seeded topsoil. This assumes that during the soil transfer operations compaction and grading were ongoing with only marginal modifications expected during cover installation.

The time required to complete Alternative H within the budget estimate of $30 million is thus estimated at

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16 The time frame is substantially more than 1.5-2.5 years estimated by the USEPA. The USEPA did not provide any calculations to support the proposed implementation schedule, therefore, critical review is impossible. However, given the geometry of the existing Taracorp Pile, its relationship to 16th and State Street, and the need to minimize dust tracking through the city, it is unlikely that truck throughput could be increased substantially beyond that assumed. Using this method of estimating and crew size, the time frame to do a city block would range from 2-3 weeks depending on the block size.

approximately seven years, compared to one to two years for Alternative D. This increase is not unexpected when one considers that the estimate for Alternate D of 1-2 years includes only 220 residential properties to a depth of 3" while Alternative H includes 1690 properties to a depth of 6".

C. EPA Failed To Consider The Technical Infeasibility Of Implementing Alternative H.

Even more eggregious than the errors in EPA's cost and implementation time estimate is EPA's failure to address the technical obstacles to implementation of Alternative H. Alternative H proposed to dig up soils from Areas 3 through 8 with lead levels greater than 500 ppm in residential areas and place the soils on the existing Taracorp pile. The pile will then be capped. EPA has erroneously assumed, however, that excavated material can be disposed on the Taracorp pile. The placement of an additional 160,000 cubic yards of soil on an 85,000 cubic yard pile will violate USEPA guidance for side slopes on waste piles[17] and impair the physical integrity of the site. Therefore, EPA's option is to purchase the adjacent lot occupied by TriCity Trucking for disposal (which is in a 100 year flood plain) or dispose of the additional soil off-site. Off-site disposal will increase the cost of Alternative H by an additional $5 million. Expansion of the Taracorp pile into a flood plain is truly nonsensical, if the

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17 EPA 625/6 - 85/006 at p. 3-20.

purpose of this project is to prevent releases of lead into the environment.

Moreover, EPA's proposed Alternative H results in a five-fold increase in the areas to be remediated when compared to Alternative D. This enormous area of off-site remediation was never contemplated by O'Brien & Gere, and was only proposed by EPA after O'Brien & Gere's RI/FS work had been completed. Consequently, the remedial investigation does not include enough data points to identify and define the appropriate extent of Areas 4-8 to be remediated.

EPA's remedial Alternative H partially relies upon "Soil A" sample data selected from the "Study of Lead Pollution in Granite City, Madison and Venice, Illinois" (1983), p. 28-30. The IEPA report presented four distinct soil sample classifications or groups. "Soil B" samples, "which were intended to indicate levels to which children would most likely be exposed, were taken from open dirt areas in yards, playgrounds, etc." The soil B samples split between IEPA, IDPH, and USEPA were not considered during the development of Alternative H, however.

Moreover, the biased limited sampling data offered by USEPA to support such remediation was not reviewed in the RI. Amazingly, EPA has relied on only five residential soil samples to require the remediation of almost 600 residences in Area 4, and seven soil samples for the remediation of Area 8, which includes over 600 residences. It is clear that such limited

sampling provides an insufficient basis for the massive scale soil removal program proposed by EPA in Alternative H.

VI. ALTERNATIVE H'S INCREASED RISK TO RESIDENTS AND ADVERSE IMPACTS ON THE COMMUNITY AND THE ENVIRONMENT ARE NOT JUSTIFIED BY THE MINIMAL PROTECTION IT PROVIDES.

Implementation of Alternative H will result in the excavation and disposal of 160,000 cubic yards of soil compared to 23,000 cubic yards for NL's proposed Alternative D. EPA admits that the "amount of digging required could expose the community to contaminated dust." (EPA Clean-up Alternatives.) What it has not analyzed or made clear to the public is that Alternative H will have significantly more adverse community and environmental impacts than Alternative D.

First, Alternative H will require almost 40,000 Dump Truck Traffic loads traveling on Granite City streets, compared to 6900 loads for Alternative D. This results in a 600% increased risk of traffic fatality or injury -- which is a far more adverse impact than any increased lead exposure from a 1,000 ppm rather than 500 ppm clean-up level. Moreover, the adverse impact from air pollution due to vehicle emissions and unavoidable lead emissions from soil in dumptrucks as they travel through Granite City roads has not been considered.

Furthermore, excavation of this enormous volume of soil will have substantial construction impacts on the community with little benefit in return. Residents will be subject to noise, debris, traffic, parking restrictions, dust

and the general inconvenience of construction for several years as the project proceeds. It is difficult to even imagine the scale of a soil removal program encompassing 97 city blocks, let alone the consequences for the residents living through it.[18]

Section 121(b)(1)(b) of CERCLA, 42 U.S.C. § 6921(b)(1)(b), requires that when assessing remedial actions EPA shall, at a minimum, take into account the potential threat to human health and the environment associated with excavation, transportation, and redisposal, or containment. The National Contingency Plan similarly requires that the method and cost of mitigating adverse impacts be taken into account and that alternatives that have significant adverse effects with very limited environmental benefits should be excluded from further consideration. 40 C.F.R. § 300.68(g)(3), and (h)(vi). EPA has not provided any information in this record explaining how it proposes to mitigate the adverse impacts from this massive construction and excavation project, which will unavoidably increase lead emissions in the Granite City community. Nor has it provided valid scientific support for the implementation of a 500 ppm clean-up level. The failure to analyze the

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18 In addition, EPA has not analyzed the impact on surface water and groundwater from its proposed use of wetting agents and surfactants to control dust during excavation. The cost of purchasing these materials as well as treating their discharge has not been addressed or included in EPA's cost estimate.

consequences of Alternative H on the Granite City community or justify the use of a 500 ppm clean-up level not only violates CERCLA, but the public's trust in EPA.

VII. CONCLUSION

NL has demonstrated in these comments that EPA's selection of Proposed Alternative H has no valid technical or scientific justification and falls far short of CERCLA's requirement of a cost effective remedy which will protect public health and the environment. In contrast, Alternative D will not only protect the residents of the Granite City community and the surrounding environment, it is cost effective and technically feasible in terms of project duration and ability to remedy and prevent future releases of lead into the environment.

NL performed a three-pronged site-specific risk assessment with detailed scientific references and provided the Agencies with numerous recent studies and information on lead exposure in support of the implementation of Alternative D. To support Alternative H, EPA relied on extremely limited data, which consisted of generic vegetable uptake studies irrelevant to the site, an outdated lead exposure review, a Superfund Record of Decision and a pilot program for lead remediation which has not even been completed. These comments demonstrate that each of these studies was irrelevant to Granite City conditions and/or based on outdated information on lead

exposure prior to the phasedown of leaded fuels. Morover, EPA has completely failed to address the substantial adverse impacts on the community from the enormous excavation and construction required in Alternative H or the methods to mitigate such impacts.

When the record is reviewed as a whole, it is clear that EPA has no support for the selection of Alternative H as a remedy at the Taracorp site. Selection of such remedy and rejection of Alternative D is arbitrary and capricious, violating the requirements of CERCLA and the Administrative Procedure Act governing federal agency action.

REFERENCES CITED

ATSDR. 1988. Toxicological Profile for Lead (draft). Agency for Toxic Substances and Disease Registry. U.S. Public Health Service. Atlanta, GA.

Bassuk, N.L. 1986. Reducing Lead Uptake in Lettuce. HortScience. 21:993-995.

Binder, S., D. Sokal, and D. Maughan. 1986. Estimating Soil Ingestion: The Use of Tracer Elements in Estimating the Amount of Soil Ingested by Young Children. Arch. Environ. Health. 41: 341-345.

Budavari, S. 1989. The Merck Index. 11th ed. pages 852-853. Merck & Co., Inc. Rahway, NJ.

Cincinnati Soil Lead Demonstration Project, EPA No. V00 5035-01.

Clark, et al., The Cincinatti Soil-Lead Abatement Demonstration Project. Proceedings of Lead in Soil: Issues and Guidelines, Supp. to Vol. 9 (1989). Environmental GeoChemistry and Health.

Clausing, P., B. Brunekreef, J.H. Van Wijnen. 1987. A Method for Estimating Soil Ingestion by Children. Int. Arch. of Occup. Environ. Health. 59:73-82.

Duggan M. 1980. Lead in Urban Dust: An Assessment. Water, Air, and Soil Pollution. 14: 309-321.

EFH. 1989. Exposure Factors Handbook. U.S. EPA Office of Health and Environmental Assessment, Washington, DC 20460. EPA/600/8-89/043. July 1989.

HHEM. 1989. Risk Assessment Guidance for Superfund. Volume I. Human Health Evaluation Manual (Part A). Interim Final. page 6-31. U.S. EPA Office of Emergency and Remedial Response, Washington, DC 20460.

IEPA. 1983. Study of Lead Pollution in Granite City, Madison and Venice, Illinois. Illinois Environmental Protection Agency, Springfield, IL 62706. April, 1983.

Johnson, T. and L. Wijnberg. 1988. Statistical analysis of lead exposure data collected in East Helena, Montana: Draft report. PEI Associates, Inc. Durham, N.C., January, 1988. (as cited in U.S. EPA 1989).

Logan, T.J. and R.L. Chaney. 1983. Proceedings of the 1983 Workshop on Utilization of Municipal Wastewater and Sludge on Land. Eds. A.L. Page et al. pages 256-257. University of California. Riverside, CA.

Madhavan, S., K.D. Rosenman, and T. Shehata. 1989. Lead in Soil: Recommended Maximum Permissible Levels. Environ. Research. 49:136-142.

O'Flaherty, E.J. 1981. Toxicants and Drugs: Kinetics and Dynamics. page 287. John Wiley & Sons, New York, NY.

Rabinowitz, M.B.and D.C. Bellinger. 1988. Soil Blood-Lead Relationship Among Boston Children. Bull. Environ. Contam. Toxicol. 41:791-797.

Spittler, T.M. and W.A. Feder. 1979. A Study of Soil Contamination and Plant Lead Uptake in Boston Urban Gardens. Commun. Soil Sci. Plant Anal. 10:1195-1210.

Stark, A.D., R.F. Quah, J.W. Meigs, E.R. DeLouise. 1982. The Relationship of Environmental Lead to Blood-Lead Levels in Children. Env. Res. 27:373-383.

U.S. EPA. 1986. Air Quality Criteria for Lead. U.S. Environmental Protection Agency, ECAO/ORD. Research Triangle Park, NC 27711. EPA-600/8-83/028dF. June 1986.

U.S. EPA. 1989. Review of the National Ambient Air Quality Standards for Lead: Exposure Analysis Methodology and Validation. (OAQPS Staff Report). U.S. Environmental Protection Agency. Office of Air Quality. Research Triangle Park, NC 27711. EPA-450/2-89-011. June 1989.

Weast, R.C. 1973. Handbook of Chemistry and Physics. 54th ed. page B-101. CRC Press. Cleveland, OH.

O'BRIEN & GERE

Memorandum

To: Files

From: J.M. O'Loughlin

Subject: NL Granite City Materials Cost Estimates

Date: 17 July 1989

File: 2844.012

Copies: F.D. Hale
D.G. Coleman
K. Lamb

1. Topsoil

a.	Litton Excavating (314) 781-6060	$65.00/7 CY
b.	Kurtz Nursery & Topsoil (314) 946-9191	$79.00/7 CY
c.	Dixon Topsoil Co. (314) 843-0134	$70.00/7 CY

Average: $10.00/CY delivered to St. Louis metro area. Sources contacted had adequate quantities available

2. Sand/Gravel

		Sand	Gravel
a.	Riverview Quarry (314) 837-3511	$3.35/ton	$4.40/ton
b.	St. Charles Quarry (314) 946-0004	$4.45/ton	$5.00/ton

Average: $3.90/ton sand, $4.70/ton gravel, not delivered.

Assume $3.30/loaded mile, 15 mile haul, 16 CY truck.
Sand 1.5 ton/yd. Gravel 1.0 ton/yd.
Sand delivered: $9.00/CY Gravel delivered: $8.00/CY

3. Clay

a. St. Charles Quarry
7921 Alabama Road
St. Louis, MO 63111

- POC: Darrel Emge (314) 544-4444 (main office)
(314) 946-0004 (quarry)
- several thousand tons currently available for cost of load and haul. estimate $7/CY load and haul to Granite City

NOTE: Clay pits, perse, do not exist in St. Louis area (Kevin Lamb, Darrel Emge). Clay generally available as a result of construction excavation, quarry excavation.

4. Summary:

Topsoil:	$10.00/CY delivered
Sand:	$ 9.00/CY delivered
Gravel;	$ 8.00/CY delivered
Clay:	$ 7.00/CY delivered

These cost estimates are based on Missouri sources, many of which are not licensed to truck to Illinois. Although better defined estimates would be based on Illinois sources, these costs should be fairly representative of material costs in that part of the country.

These costs compare favorably to Kevin Lamb's (St. Louis office) estimates of $10-$11/CY topsoil delivered and $7/CY clay delivered.

TABLE 17
NL GRANITE CITY
PRELIMINARY COST ESTIMATE
ALTERNATIVE II

	QUANTITY	UNITS	UNIT COST	EXTENDED COST	TOTAL COST
TARACORP PILE MULTIMEDIA CAP					
Grading/contouring/consolidation	44,440	SY	$3	$133,320	
Buy/haul/place 24" clay	29,630	CY	$20	$592,600	
Buy/place 40-mil synthetic cover	400,000	SF	$1	$400,000	
Buy/haul/place 6" gravel	7,400	CY	$15	$111,000	
Buy/haul/place Geotextile filter fabric	400,000	SF	$0.2	$80,000	
Buy/haul/place 6" embankment	7,400	CY	$10	$74,000	
Buy/haul/place 6" topsoil	7,400	CY	$20	$148,000	
Seed, fertilizer, mulch	44,440	SY	$1	$44,440	
Fencing	3,000	FT	10	$30,000	
SUBTOTAL				$1,613,360	$1,613,360
CONTAINED DROSSES					
Loading (Crane & Crew)	LS	LS	$800	$800	
Transport to secondary smelter (600 miles @ $3.50/loaded mile	1	Load	$2,100	$2,100	
Smelting (adjusted for recovery)	12	Ton	300	$3,600	
SUBTOTAL				$6,500	$6,500
SLLR PILES					
Excavation	3,920	CY	$25	$98,000	
Transport to Taracorp Pile	3,920	CY	$3	$11,760	
SUBTOTAL				$109,760	$109,760
VENICE ALLEYS EXCAVATE AND RESTORE					
Clear/replace incidentals	1.6	Acres	$5,000	$8,000	
Excavate to depth of 3"	670	CY	$30	$20,100	
Load and transport to Taracorp Pile	670	CY	$6	$4,020	
Grade and apply base course	5,300	SY	$3	$15,900	
Buy/haul/place asphalt	5,300	SY	$8	$42,400	
Buy/haul/place 3" topsoil	225	CY	$25	$5,625	
Buy/haul/place sod	2,700	SY	$4	$10,800	
SUBTOTAL				$106,845	$106,845
EAGLE PARK EXCAVATE AND RESTORE					
Clear	.5	Acres	$3,000	$1,500	
Manual excavation	100	CY	$60	$6,000	
Light equipment excavation	500	CY	$30	$15,000	
Heavy equipment excavation	2,100	CY	$20	$42,000	
Load and transport to Taracorp Pile	2,700	CY	$6	$16,200	
Buy/haul/place backfill	2,500	CY	$10	$25,000	
Buy/haul/place 3" topsoil	200	CY	$20	$4,000	
Buy/haul/place sod	2,200	SY	$4	$8,880	
SUBTOTAL				$118,580	$118,580

TABLE 17
NL GRANITE CITY
PRELIMINARY COST ESTIMATE
ALTERNATIVE II

	QUANTITY	UNITS	UNIT COST	EXTENDED COST	TOTAL COST
AREA 1 EXCAVATE AND RESTORE					
Clear/Replace Incidentals	13.5	ACRES	$5,000	$67,500	
Manual Excavation	465	CY	$60	$27,900	
Light Equipment Excavation	7,890	CY	$30	$236,700	
Heavy Equipment Excavation	7,890	CY	$20	$157,800	
Load and Transport to Taracorp Pile	16,245	CY	$6	$97,470	
Grade and apply pavement base course	27,200	SY	$3	$81,600	
Buy/haul/place asphalt	27,200	SY	$8	$217,600	
Buy/haul/place topsoil	9,450	CY	$20	$189,000	
Buy/haul/place sod	37,780	SY	$4	$151,120	
Buy/haul/place shrubs	10	EA	$50	$500	
B haul/place trees	5	EA	$200	$1,000	
SUBTOTAL				$1,228,190	$1,228,190
AREA 2 EXCAVATE AND RESTORE					
Clear/Replace Incidentals	11.6	ACRES	$5,000	$58,000	
Manual Excavation	4,667	CY	$60	$280,020	
Light Equipment Excavation	4,667	CY	$30	$140,010	
Heavy Equipment Excavation	0	CY	$20	$0	
Load and Transport to Taracorp Pile	9,334	CY	$6	$56,004	
Grade and apply pavement base course	23,770	SY	$3	$71,310	
Buy/haul/place asphalt	23,770	SY	$8	$190,160	
Buy/haul/place topsoil	5,372	CY	$35	$188,020	
Buy/haul/place sod	32,230	SY	$4	$128,920	
Buy/haul/place shrubs	150	EA	$50	$7,500	
Buy/haul/place trees	70	EA	$200	$14,000	
SUBTOTAL				$1,133,944	$1,133,944
AREA 3 EXCAVATE AND RESTORE					
C /Replace Incidentals	10.8	ACRES	$5,000	$54,000	
Manual Excavation	4,344	CY	$60	$260,640	
Light Equipment Excavation	4,344	CY	$30	$130,320	
Heavy Equipment Excavation	0	CY	$20	$0	
Load and Transport to Taracorp Pile	8,688	CY	$6	$52,128	
Grade and apply pavement base course	3,280	SY	$3	$9,840	
Buy/haul/place asphalt	3,280	SY	$8	$26,240	
Buy/haul/place topsoil	8,140	CY	$35	$284,900	
Buy/haul/place sod	48,840	SY	$4	$195,360	
Buy/haul/place shrubs	70	EA	$50	$3,500	
Buy/haul/place trees	30	EA	$200	$6,000	
SUBTOTAL				$1,022,928	$1,022,928

TABLE 17
NL GRANITE CITY
PRELIMINARY COST ESTIMATE
ALTERNATIVE II

	QUANTITY	UNITS	UNIT COST	EXTENDED COST	TOTAL COST
AREA 4 EXCAVATE AND RESTORE					
Clear/Replace Incidentals	60.7	ACRES	$5,000	$303,500	
Manual Excavation	24,500	CY	$60	$1,470,000	
Light Equipment Excavation	24,500	CY	$30	$735,000	
Heavy Equipment Excavation	0	CY	$20	$0	
Load and Transport to Taracorp Pile	49,000	CY	$6	$294,000	
Grade and apply pavement base course	98,000	SY	$3	$294,000	
Buy/haul/place asphalt	98,000	SY	$8	$784,000	
Buy/haul/place topsoil	32,667	CY	$35	$1,143,345	
Buy/haul/place sod	196,000	SY	$4	$784,000	
haul/place shrubs	395	EA	$50	$19,750	
Buy/haul/place trees	170	EA	$200	$34,000	
SUBTOTAL				$5,861,595	$5,861,595
AREA 5 EXCAVATE AND RESTORE					
Clear/Replace Incidentals	2.5	ACRES	$5,000	$12,500	
Manual Excavation	1,000	CY	$60	$60,000	
Light Equipment Excavation	1,000	CY	$30	$30,000	
Heavy Equipment Excavation	0	CY	$20	$0	
Load and Transport to Taracorp Pile	2,000	CY	$6	$12,000	
Grade and apply pavement base course	4,000	SY	$3	$12,000	
Buy/haul/place asphalt	4,000	SY	$8	$32,000	
Buy/haul/place topsoil	1,333	CY	$35	$46,655	
Buy/haul/place sod	8,000	SY	$4	$32,000	
Buy/haul/place shrubs	16	EA	$50	$800	
Buy/haul/place trees	7	EA	$200	$1,400	
SUBTOTAL				$239,355	$239,355
6 EXCAVATE AND RESTORE					
Clear/Replace Incidentals	19.8	ACRES	$5,000	$99,000	
Manual Excavation	8,000	CY	$60	$480,000	
Light Equipment Excavation	8,000	CY	$30	$240,000	
Heavy Equipment Excavation	0	CY	$20	$0	
Load and Transport to Taracorp Pile	16,000	CY	$6	$96,000	
Grade and apply pavement base course	32,000	SY	$3	$96,000	
Buy/haul/place asphalt	32,000	SY	$8	$256,000	
Buy/haul/place topsoil	10,667	CY	$35	$373,345	
Buy/haul/place sod	64,000	SY	$4	$256,000	
Buy/haul/place shrubs	129	EA	$50	$6,450	
Buy/haul/place trees	55	EA	$200	$11,000	
SUBTOTAL				$1,913,795	$1,913,795

TABLE 17
NL GRANITE CITY
PRELIMINARY COST ESTIMATE
ALTERNATIVE II

	QUANTITY	UNITS	UNIT COST	EXTENDED COST	TOTAL COST
AREA 7 EXCAVATE AND RESTORE					
Clear/Replace Incidentals	3.9	ACRES	$5,000	$19,500	
Manual Excavation	1,556	CY	$60	$93,360	
Light Equipment Excavation	1,556	CY	$30	$46,680	
Heavy Equipment Excavation	0	CY	$20	$0	
Load and Transport to Taracorp Pile	3,112	CY	$6	$18,672	
Grade and apply pavement base course	6,222	SY	$3	$18,666	
Buy/haul/place asphalt	6,222	SY	$8	$49,776	
Buy/haul/place topsoil	2,074	CY	$35	$72,590	
Buy/haul/place sod	12,444	SY	$4	$49,776	
B haul/place shrubs	25	EA	$50	$1,250	
haul/place trees	11	EA	$200	$2,200	
SUBTOTAL				$372,470	$372,470
AREA 8S EXCAVATE AND RESTORE					
Clear/Replace Incidentals	7.8	ACRES	$5,000	$39,000	
Manual Excavation	3,127	CY	$60	$187,620	
Light Equipment Excavation	3,127	CY	$30	$93,810	
Heavy Equipment Excavation	0	CY	$20	$0	
Load and Transport to Taracorp Pile	6,254	CY	$6	$37,524	
Grade and apply pavement base course	12,507	SY	$3	$37,521	
Buy/haul/place asphalt	12,507	SY	$8	$100,056	
Buy/haul/place topsoil	4,169	CY	$35	$145,915	
Buy/haul/place sod	25,015	SY	$4	$100,060	
Buy/haul/place shrubs	51	EA	$50	$2,550	
Buy/haul/place trees	22	EA	$200	$4,400	
SUBTOTAL				$748,456	$748,456
A 8N EXCAVATE AND RESTORE					
Clear/Replace Incidentals	57.8	ACRES	$5,000	$289,000	
Manual Excavation	23,322	CY	$60	$1,399,320	
Light Equipment Excavation	23,322	CY	$30	$699,660	
Heavy Equipment Excavation	0	CY	$20	$0	
Load and Transport to Taracorp Pile	46,644	CY	$6	$279,864	
Grade and apply pavement base course	93,289	SY	$3	$279,867	
Buy/haul/place asphalt	93,289	SY	$8	$746,312	
Buy/haul/place topsoil	31,096	CY	$35	$1,088,360	
Buy/haul/place sod	186,578	SY	$4	$746,312	
Buy/haul/place shrubs	376	EA	$50	$18,800	
Buy/haul/place trees	162	EA	$200	$32,400	
SUBTOTAL				$5,579,895	$5,579,895

TABLE 17
NL GRANITE CITY
PRELIMINARY COST ESTIMATE
ALTERNATIVE H

	QUANTITY	UNITS	UNIT COST	EXTENDED COST	TOTAL COST
OTHER COSTS					
Monitoring Well	90	LF	$60	$5,400	
Deed Restrictions	LS	LS	$15,000	$15,000	
Safety Program	LS	LS	$40,000	$40,000	
Mobilization	LS	LS	$65,000	$65,000	
Dust Control	LS	LS	$40,000	$40,000	
Equipment Decontamination	LS	LS	$40,000	$40,000	
Off-Site Drainage Control	LS	LS	$25,000	$25,000	
SUBTOTAL				$230,400	$230,400
ESTIMATED DIRECT CAPITAL COST					$20,286,073
INDIRECT CAPITAL COSTS					
Contingency Allowance (25%)					$5,071,518
Engineering Fees (15%)					$3,042,911
Legal Fees (5%)					$1,014,304
ESTIMATED INDIRECT CAPITAL COST					$9,128,733
TOTAL ESTIMATED CAPITAL COST					$29,414,806
ANNUAL OPERATING AND MAINTENANCE COSTS					
Air monitoring	2	Mandays	$250	$500	
Sample analysis	8	Samples	$1,000	$8,000	
Groundwater sample collection	8	Mandays	$250	$2,000	
Sample analysis	22	Samples	$150	$3,300	
Site mowing	26	Mandays	$250	$6,500	
Site inspection	8	Mandays	$250	$2,000	
Miscellaneous site work	36	Mandays	$250	$9,000	
ite work materials	LS	LS	$4,000	$4,000	
ESTIMATED ANNUAL O & M				$35,300	
PRESENT WORTH OF ANNUAL O % M FOR 30 YEARS (I=5%)				$542,630	$542,630
ALTERNATIVE H ESTIMATED COST					$29,957,436

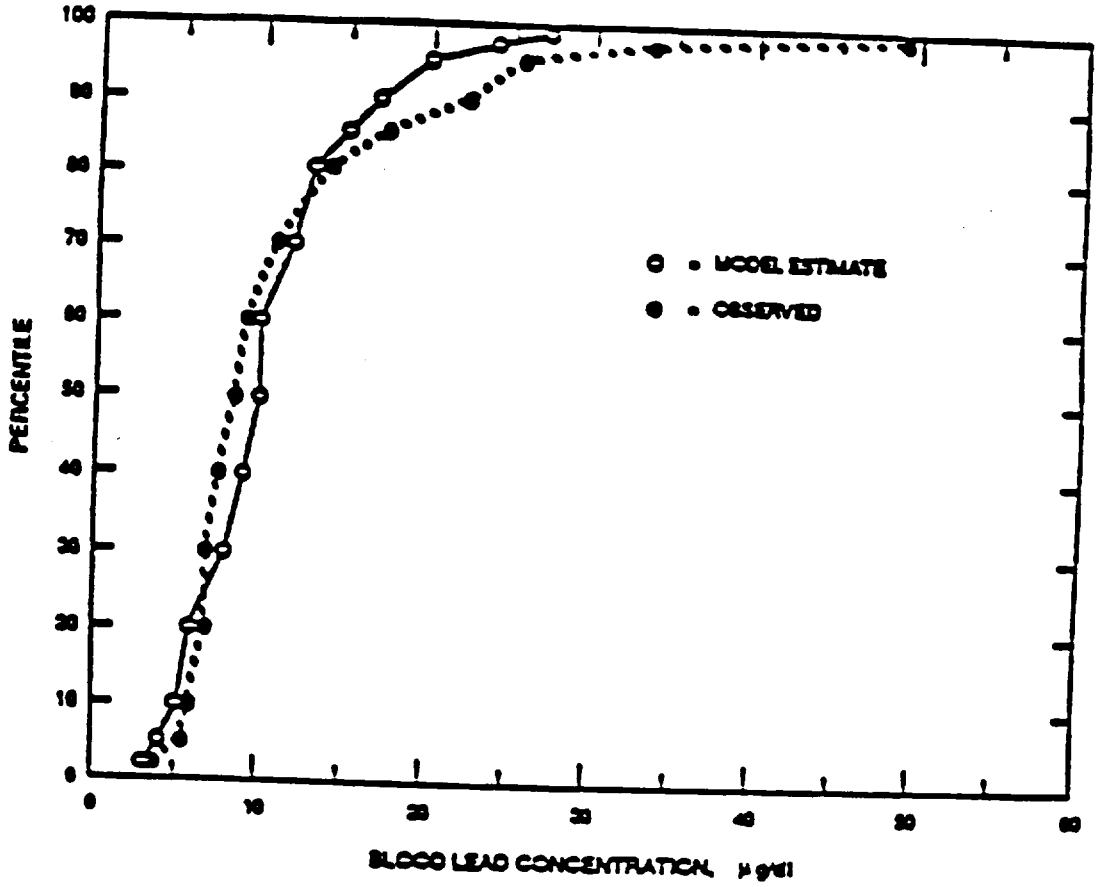

FIGURE 2

Comparison of Distribution of Measured Blood Lead Levels in Children, 1-5 Years of Age, Living Within 2.25 Miles of a Lead Smelter With Levels Predicted From the Uptake/Biokinetic Model. Dust and Soil Lead Levels Were Estimated Using Default Calculations.

Source: U.S. EPA, 1989a

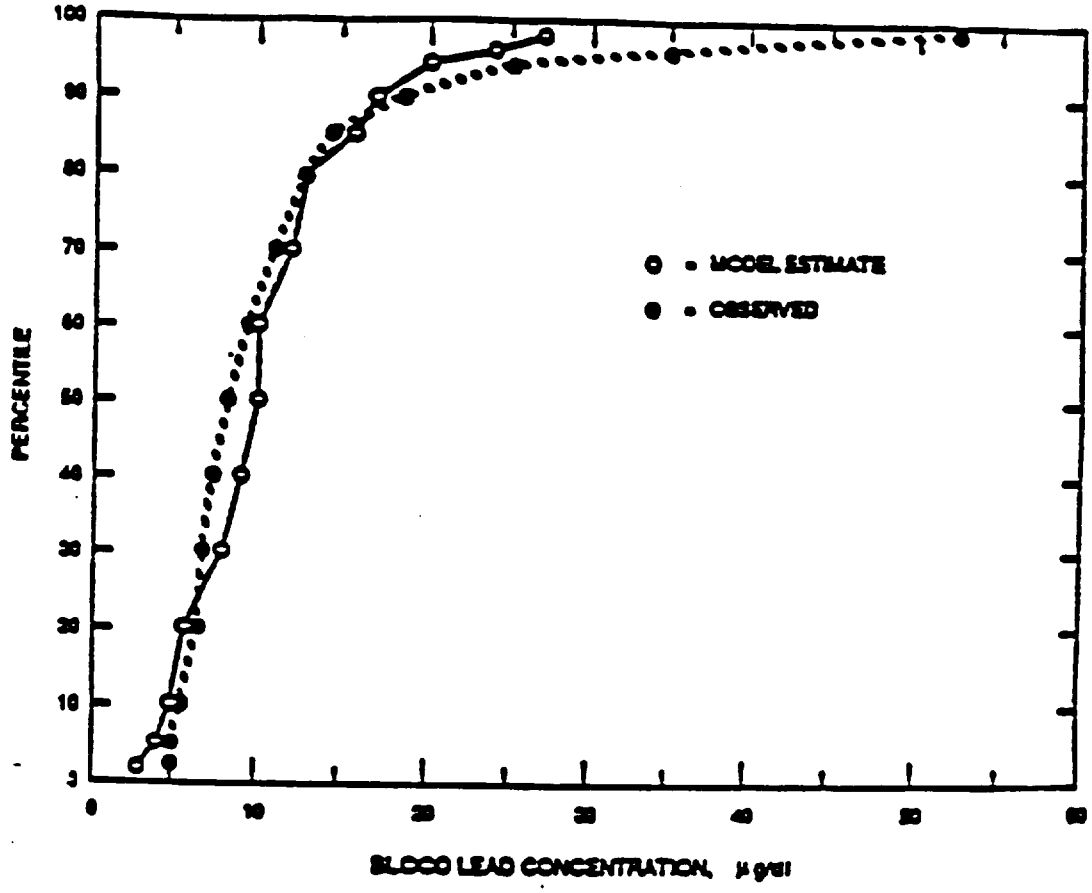

FIGURE 1

Comparison of Distribution of Measured Blood Lead Levels in Children, 1-5 Years of Age, Living Within 2.25 Miles of a Lead Smelter With Levels Predicted From the Uptake/Biokinetic Model. Measured Dust and Soil Lead Levels Were Included in the Input Parameters to the Model.

Source: U.S. EPA, 1989a

to Directors, Regional Waste Management Divisions Re: Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites. OSWER Directive #9355.4-02.

Perera, F.P., and A.K. Ahmed. 1979. Respirable Particles. Cambridge, MA: Ballinger Publishing Company.

Steele, M.J., B.D. Beck, and B.L. Murphy. 1989. "Assessing the contribution from lead in mining waste to blood lead." Accepted for publication in Regulatory Toxicology and Pharmacology.

U.S. Department of Health and Human Services (Agency for Toxic Substances and Disease Registry). July 1988. The Nature and Extent of Lead Poisoning in Children in the United States: A Report to Congress. Atlanta, GA: U.S. DHHS, ATSDR.

U.S. Department of Health and Human Services (Centers for Disease Control). January 1985. Preventing Lead Poisoning in Young Children.

U.S. Environmental Protection Agency (Office of Air Quality Planning and Standards). 1989a. Review of the National Ambient Air Quality Standards for Lead: Exposure Analysis Methodology and Validation. EPA-450/2-89-011.

U.S. Environmental Protection Agency (Office of Health and Environmental Assessment). 1989b. Technical Support Document on Lead. (First Draft.) ECAO-CIN-G7.

U.S. Environmental Protection Agency (Office of Drinking Water). 1988. Drinking Water Regulations; Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper; Proposed Rule. Federal Register, 53(160):31516-31578. 40 CFR Parts 141 and 142.

U.S. Environmental Protection Agency (Environmental Criteria and Assessment Office). March 1986. Air Quality Criteria for Lead. EPA-600/8-83/028C.

Wixson, R. 1989. Presentation on Methodology for Establishing Soil Cleanup Standards Developed by the Lead Task of the Society of Environmental Geochemistry and Health at their May 29-June 1, 1989 meeting in Cincinnati, OH.

References

Andrews, R.D. 1975. " Tailings: Environmental Consequences and Review of Control Strategies." Paper presented at the International Conference on Heavy Metals in the Environment, Toronto, Ontario, Canada.

Barltrop, D., and F. Meek. 1979. "Effect of Particle Size on Lead Absorption from the Gut." Arch. Environ. Health, 34:280-285.

Bornschein, R.L., C.S. Clark, J. Grote, S. Roda, B. Peace, and P. Succop. 1988. "Soil/Lead-Blood/Lead Relationships in an Urban Community and in a Mining Community." Paper presented at a Conference on Lead in Soil: Issues and Guidelines, March 7-9, 1988, at Chapel Hill, North Carolina.

Chaney, R.L., H.W. Mielke, and S.B. Sterrett. 1988. "Speciation, Mobility, and Bioavailability of Soil Lead." Environ. Geochem. and Health. In Press.

Davies, B.E., and B.G. Wixson. 1985. "Trace Elements in Surface Soils from the Mineralized Area of Madison County, Missouri, USA." J. Soil Science, 36:551-570.

Duggan, M.J., and S. Williams. 1977. "Lead-in-Dust in City Streets." Sci. Total Environ., 7:91-97.

Harley, N.H., and T.H. Kneip. January 30, 1985. An Integrated Metabolic Model for Lead in Humans of All Ages. Final Report to the U.S. EPA, Contract No. B44899 with the New York University School of Medicine, Dept. of Environmental Medicine.

Healy, M., P. Harrison, M. Aslam, S. Davies, and C. Wilson. 1982. "Lead Sulfide and Traditional Preparations: Routes for Ingestion, and Solubility and Reactions in Gastric Fluid." J. Clin. Hosp. Pharm., 7:169-173.

Kneip, T.J., R.P. Mallon, and N.H. Harley. 1983. "Biokinetic modelling for mammalian lead metabolism." Neurotoxicol., 4:189-192.

Lagerweff, J.V., and D.L. Brower. 1975. "Source Determination of Heavy Metal Contaminants in the Soil of a Mine and Smelter Area." Trace Substances in Environmental Health, 9:207-215.

Longest, H.L., and B. Diamond (U.S. EPA, Directors, Office of Emergency and Remedial Response and Office of Waste Program Enforcement). September 7, 1989. Memorandum

no clear method for incorporating site-specific considerations into the setting of soil cleanup levels for specific lead-contaminated sites.

The generic values proposed by EPA should be replaced by a systematic process which incorporates the substantial amount of information which is available on lead toxicity, uptake, and body burden. This process would include use of the IU/BK model (or similar models incorporating information on the relationships between environmental and body burden concentrations of lead, such as that under development by SEGH) as well as consideration of such critical factors as the bioavailability of different forms of lead. The population of concern, target blood lead levels, and the fraction of the population to be protected by the soil cleanup levels should also be specified in a consistent way. Such an approach would both provide a scientifically valid basis for deriving soil cleanup levels and would allow for incorporation of site-specific and other considerations. The type of results generated by this approach would also assist in understanding more clearly the impacts of proposed remedies on reducing risks from lead exposure.

subgroups of primary concern, different exposure pathways of concern, or different durations of exposure to site contamination. For example, children are unlikely to have much if any exposure to lead-contaminated soils at industrial sites. Thus, a different population subgroup, such as workers, is likely to be of primary concern for these sites. Childhood exposure to commercial sites would be determined in part by their proximity to residential areas, and would occur to a lesser extent than residential exposures. For non-agricultural rural lands (for example, parks, open space), risk would need to be determined in much the same way as for commercial property. Food chain exposures are likely to be of primary concern for agricultural lands. Adoption of procedures which allow for easier incorporation of these considerations into soil cleanup level derivation would result in cleanup standards which better reflect actual risks.

Conclusions

In summary, EPA's interim guidance provides inadequate documentation of the rationale and bases for the soil lead guidance levels proposed by the Agency. Their guidance neither uses the CDC soil values as intended by CDC nor acknowledges the substantial technical database available for setting soil lead cleanup levels. This lack of basis for their guidance levels casts doubt on the validity of the values proposed by EPA and provides

In summary, in establishing soil guidelines for a contaminant, site-specific and contaminant-specific characteristics must be considered. The source and type of lead present at a specific site can influence both its bioavailability and its distribution in the environment, and resulting human exposures. Such factors would strongly influence development of appropriate cleanup levels.

3.4 Consideration of Site-Specific Issues

As acknowledged by EPA, site-specific considerations may require derivation of different soil cleanup levels than those proposed by the Agency. If the approaches suggested above were adopted, it is not clear that any generic cleanup levels would be either necessary or appropriate. Site-specific factors to be considered would include the form of lead present at a site (e.g., lead from mining activities versus lead from smelting activities with impacts as described above) and characteristics of the surrounding population (e.g., its proximity and demographics).

Although the current interim guidance is described as being appropriate for "residential settings", other types of sites (e.g., industrial, commercial, or agricultural) may also require establishment of soil cleanup levels. Other site uses (either current or future) would necessitate different considerations in setting cleanup levels, such as different population

The transfer of lead in soils to housedust has also been observed to vary according to the source of the lead, yielding different exposure patterns. For example, in urban settings or areas with operating smelters, indoor dust concentrations were similar to soil concentrations (U.S. EPA, 1986). In mining studies, however, indoor dust concentrations were less than soil concentrations, varying from about 15 to 45% of the soil concentration when soil concentrations were greater than about 500-1000 ppm (Barltrop, 1975; Barltrop, 1988; Davies et al., 1985). At lower soil concentrations, housedust concentrations were often similar to or greater than soil concentrations, probably reflecting the predominance of indoor sources of housedust lead (e.g., paint) at lower soil concentrations.

Possible reasons for lower housedust lead concentrations in mining communities include the fact that in urban communities and/or communities with operating smelters, lead from deposition of airborne lead is more pervasive on soil surfaces, and thus is more available to be tracked into homes. In addition, airborne lead can penetrate buildings and contribute to housedust lead concentrations in this manner. Such differences are due in part to particle size. In particular, the particle size of mine wastes is sufficiently large that airborne particles from a mine waste source tend to settle out quickly and do not deposit in as broad an area as the smaller aerosols from stack air emissions, which stay airborne longer and travel farther (Davies and Wixson, 1985; Lagerweff and Brower, 1975). Larger particles are also less likely to enter homes and thus to contribute to house dust concentrations of lead.

in the range of 10 to 1,000 μm with none smaller than 1 μm (Andrews, 1975). In contrast, primary particles emitted from smelters fall in the 1 to 3 μm size range, with a significant number of particles smaller than 1 μm (Perera and Ahmed, 1979).

Lead species is another critical factor in determining bioavailability. For example, animal toxicology studies show that some lead species are absorbed to a lesser extent than others. Lead sulfide is significantly less absorbed than lead acetate and lead oxides (Barltrop and Meek, 1975). Sampling data have demonstrated that mine waste lead is mostly in the form of lead sulfide, a species of lower availability. By contrast, most lead in street dust is in the sulfate, halide, or oxide forms (Duggan and Williams, 1977).

Another factor which appears to reduce the bioavailability of lead in mine waste is the binding effect of the surrounding soils and rock matrix. The natural binding effect of lead in soils is enhanced in the case of mine waste or galena tailings, by the rock matrix surrounding the residual lead. In galena, the lead sulfide is embedded in a rock matrix, typically quartz. This rock matrix appears to reduce significantly the lead that is available for dissolution in the stomach (Bornschein, 1988). For example, recent reviews of the impact of soils on the bioavailability of lead (Steele et al., 1989; Chaney et al., 1988) have shown that while powdered lead sulfide is essentially as available as more soluble forms of lead, lead sulfide is likely to be much less bioavailable when found in mining wastes.

3.3 Consideration of Differences in Bioavailability and Outdoor/Indoor Transfer of Lead from Different Sources

In the case of lead, most information on the relationship between blood lead and lead in soils is derived from studies conducted in urban communities or communities with operating smelters. As discussed above, based largely on these types of studies, the U.S. Centers for Disease Control (CDC) has suggested that when soil lead concentrations exceed 500-1,000 ppm, children's blood lead levels may increase above background levels (U.S. DHHS, 1985). The current literature suggests, however, that children living in mining towns without a recent history of smelting activities do not suffer from elevated blood lead concentrations. Particle size, lead species, and soil characteristics appear to be the primary factors behind this noted difference in impacts of soil lead from mining versus smelter sites on blood lead levels in children (Chaney, 1988). These factors appear to influence lead bioavailability and patterns of lead transport and exposure.

Studies have shown that dissolution of lead in the gut is a function of the surface-to-mass ratio associated with particle size (Steele et al., 1989; Healy et al., 1982; Barltrop and Meek, 1979). The larger the particle size, the smaller the relative surface area, and the lower the bioavailability. The influence of particle size on intestinal absorption was found to be especially important with particles < 100 μm in diameter (Barltrop and Meek, 1979). The particle sizes of a variety of tailings materials from different ores have been measured

Agency also states that blood lead testing should not be the "sole criterion for evaluating the need for long-term remedial action at sites that do not already have an extensive, long-term blood-lead data base." While long-term data are clearly desirable, their absence or incompleteness should not totally preclude use of models such as the IU/BK. Indeed, it seems that if the Agency is concerned about remedial action decision-making in the face of limited data, it should encourage the use of models such as the IU/BK. In particular, to the extent that any blood lead data are available, they could be used to validate the assumptions used in the IU/BK model. The empirical data and modeling results together would provide insights into the site-specific relationships between soil concentrations and blood lead levels, yielding a stronger base for assessing appropriate soil cleanup levels.

In summary, the advantages to using the IU/BK model for establishing soil guidelines are that the model: incorporates flexibility in approaches to regulating exposures to lead, allows for the use of the most current site-specific data, results in the prediction of population distributions of blood lead concentrations, can provide a stronger basis for evaluating site-specific relationships between environmental concentrations and blood lead levels, and is consistent with derivation of the NAAQS and MCL for lead, as well as approaches to assessing lead toxicity undertaken by other groups.

estimates of dust and soil lead were used in the model, predicted mean blood lead levels were within 2% of observed.

The Lead Exposure Subcommittee of the Clean Air Scientific Advisory Committee (CASAC) has "unanimously" agreed that the OAQPS document, "Review of the National Ambient Air Quality Standards for Lead: Exposure Analysis Methodology and Validation" (U.S. EPA, 1989a, which describes the IU/BK model) is scientifically adequate for use in the standard setting process for lead as an ambient air pollutant. The CASAC endorsed the opinion of its subcommittee in a recent letter addressed to U.S. EPA Administrator William Reilly (U.S. EPA, 1989a).

In addition, the recent "Technical Support Document on Lead" (U.S. EPA, 1989b), prepared by the U.S. EPA Office of Health and Environmental Assessment, stated that the IU/BK model "provides a useful and versatile method for exploring the potential impact of future regulatory decisions regarding lead levels in air, diet, and soil." The authors observe that the use of the IU/BK model has revealed that dust and soil ingestion are the largest sources of lead exposure in 2-year-old children in areas near a lead point source in which air lead levels are typical for urban areas in the United States.

In its September 7 directive, EPA implies that models such as the IU/BK may only be used where extensive, long-term environmental and biological data are available for a site. The

assumptions and values on which uptake rate and blood lead calculations are based can be replaced with available site-specific data or revised defaults. Thus, the model can be updated as new information on exposure levels, intake and uptake parameters become available.

To apply the model, a baseline blood lead level representing routine exposures to lead in food, air, and water is compiled. Then, the contributions to blood lead from exposure to housedust and soil are added to the baseline. The IU/BK model is then used to calculate mean blood levels by multiplying estimated lead input rates (in μg/day) by age-specific biokinetic slope factors (BSF, in μg/dL per μg/day). The mean blood lead levels can then be used to estimate the frequency distribution, a useful parameter for risk assessment purposes, for lead levels in populations of children (U.S. EPA, 1989b).

The results of several validation exercises conducted by the U.S. EPA for the IU/BK model (Figures 1 and 2) indicate that the model accurately predicts mean blood lead levels and population distributions associated with multimedia exposures in children (U.S. EPA, 1989a). These analyses assume a soil ingestion rate of 80-135 mg/day and 25% gastrointestinal absorption of lead from soil. Figure 1 shows that when site-specific data for air, dust, and soil lead were used in the model, predicted and observed mean blood lead levels and distributions were essentially identical. Figure 2 shows that when default

Geochemistry and Health is developing a methodology for establishing soil cleanup levels which incorporates information on the relationship between soil lead and blood lead (Wixson, 1989).

One of the most intensively evaluated models of this type is the Integrated Uptake/Biokinetic Model (IU/BK), which quantifies the relationship between environmental (i.e., air, dust/soil) and dietary lead levels and the associated blood lead levels. This model was selected by the U.S. EPA Office of Air Quality Planning and Standards (OAQPS) as a regulatory tool in setting a National Ambient Air Quality Standard (NAAQS) for lead. For this standard setting process, OAQPS is using the model to predict blood lead concentrations in children under different exposure conditions (U.S. EPA, 1989a).

The uptake portion of the model, developed by Kneip et al. (1983), accepts site-specific data or default values for lead levels in each medium and combines this information with assumptions regarding behavioral and physiological parameters (i.e., time spent indoors and outdoors, time spent sleeping, diet, dust/soil ingestion rates, daily breathing volumes, deposition efficiency in the respiratory tract, and absorption efficiency in the respiratory tract and gastrointestinal tracts (U.S. EPA, 1989b)). The biokinetic portion of the model (Harley and Kneip, 1985) accepts uptake predictions and computes age-specific blood lead levels based on a six-compartment biokinetic model of tissue distribution and excretion of lead (U.S. EPA, 1989b). Overall, the IU/BK model is very versatile in that the default

lead absorption and retention rates compared to older children and adults. fetal exposures (via maternal exposures) to lead-contaminated soils will be much less than young child exposures. It is likely that the difference in magnitude of exposures may more than account for any difference in susceptibility to lead exposures (as indicated by blood lead levels) that may exist between fetuses and young children. By ignoring these factors, EPA has failed to develop soil cleanup criteria for lead-contaminated sites based on a consistent description of exposed populations of concern, exposure pathways, and acceptable exposure criteria.

3.2 Appropriate Use of Uptake Factors and Models in Setting Soil Cleanup Levels

In setting the current soil cleanup levels, EPA has dismissed the use of biokinetic uptake models, stating that such models may only be used where extensive environmental and biological data are available. This approach disregards the important contributions that such models can make towards understanding the interrelationships between environmental exposures, human body burden, and health impacts. It is also inconsistent with efforts being made in other parts of the Agency as well as by other groups. For example, in proposing a Maximum Contaminant Level (MCL) for lead in drinking water, EPA's Office of Drinking Water applied an uptake factor relating lead intake via water to blood lead levels (U.S. EPA, 1988). Similarly, the Task Force of the Society of Environmental

3 EPA's soil cleanup levels fail to incorporate available modeling procedures and toxicological and site-specific data which must be considered in developing soil cleanup levels for lead-contaminated sites.

3.1 Exposure Considerations in Setting Soil Cleanup Levels

As noted above, EPA's guidance fails to identify the population to be protected by the stated cleanup levels. For residential settings, the stated setting of concern in the September 7 guidance, young children have been the primary population at risk due to exposure to lead-contaminated soils. This is due to their increased susceptibility to the neurological effects of lead (as compared to adults) as well as the likelihood of their greater exposure to lead, especially via soil ingestion.

Recently, increasing concern has been expressed over neurological impacts observed following prenatal exposures to lead at blood lead levels (10-15 μg/dl) which are lower than those previously thought to be acceptable for postnatal exposures for young children (25 μg/dl). While such impacts may exist, it must be recognized that the exposure pathway for fetuses from lead-contaminated soils is substantially different from that for young children. Specifically, while young children may directly ingest lead-contaminated soils, fetuses are only exposed to lead-contaminated soils via maternal ingestion and contact. Because young children are known to have enhanced soil ingestion rates as well as higher

lead levels or anticipated health effects, the impacts of changes in background blood lead levels on their view of these soil/dust concentrations is difficult to assess.

Another difference between the CDC derivation of the soil lead concentration of concern and EPA's intended use of this range is the types of sites, and thus the types of lead, involved. CDC's review focused mainly on smelter sites and sites with typical urban lead exposures, including lead-based paints. The site cleanup levels will be applied to CERCLA sites, including mining sites. As discussed in Comment 3 below, evidence exists indicating differential absorption of lead derived from different sources. Variations in outdoor/indoor transfer of lead for different site types may also influence application of the CDC range to CERCLA sites as the CDC evaluation looked at soil and dust exposures together, without segregating their individual effects. These factor may further increase the inappropriateness of EPA's adoption of the CDC values.

The EPA directive, in adopting the CDC soil range for cleanups at hazardous waste sites, clearly has extended the use of these values well beyond their original intended purpose. Differences between the types of sites reviewed by CDC and those for which cleanup levels would be applied, as well as changes in background blood lead levels since the time of derivation of CDC's values, were not acknowledged by the Agency. Most importantly, EPA failed to provide a scientific basis for application of these values or to link exposures in excess of the suggested levels with adverse health effects.

a reflection of professional judgment regarding the impacts of soil and dust lead on blood lead. The committee never intended for the information provided to be used as a regulation.

It should also be noted that background blood lead levels in the U.S. have decreased since the time at which the CDC report was issued. As outlined in Appendix C of the OAQPS Staff Report on lead (U.S. EPA 1989a), sources of lead that contribute to background levels of blood lead in the population have been decreasing since at least 1978. The changes that have been observed are partly due to the phase-down in use of leaded gasoline. This phase-down has been paralleled by a decline in blood lead levels, which is anticipated to continue into the 1990s. Similarly, dietary intake of lead has been decreasing since the late 1970s, and should continue to decrease as atmospheric deposition of lead onto foods, use of lead-soldered cans, and drinking water levels of lead all continue to decline. With the impact of these changes, EPA estimates that the 1990 baseline average blood lead levels for two year old children will be 28 to 35 percent of the baseline in 1978.

These changes in background levels would alter the significance of CDC's statement in terms of the blood lead levels which would result from exposures to soil and dust with lead concentrations of 500-1,000 ppm as well as in terms of the health impacts which might be expected. Since, as discussed above, no documentation is provided by CDC for blood

EPA as a "recommendation," however, appears in the 1985 CDC document Preventing Lead Poisoning in Young Children, under the heading "Sources of Lead Exposure." Examination of the information provided in this document as well as contacts with CDC staff provides no indication that CDC either intended these levels to be interpreted as levels of concern for adverse health effects or as levels to be used in establishing site cleanup standards. In other words, CDC did not make a "recommendation" at all.

As quoted in EPA's directive, the CDC document specifically states that "...lead in soil and dust appears to be responsible for blood levels in children increasing above background levels when the concentration in the soil or dust exceeds 500 to 1,000 ppm." No indication is provided of the background level used or of any potential occurrence of adverse effects following exposure to soil or dust lead levels in this range. With no index to either the magnitude of increase in blood lead from exposure or to anticipated health effects of such exposures, the CDC statement is merely an observation of a statistical measure. It provides no indication that exposure to the stated range of soil and dust lead levels will result in blood lead levels of health significance.

In addition, CDC provides no documentation of the derivation of their statement that blood lead levels increase with soil lead levels greater than 500-1,000 ppm. In personal communication, CDC staff indicated that the statement was intentionally not referenced. Instead, the committee preparing the CDC document provided this statement merely as

considerations in identifying populations of primary concern and levels of exposure and risk. Such information has already undergone extensive review and compilation by several EPA offices as well as other Federal agencies (U.S. EPA, 1989a, 1989b, 1986; U.S. DHHS, 1988, 1985).

These factors, and their appropriate application in developing soil cleanup levels, are discussed in Comment 3 below. It should also be noted that, as acknowledged by EPA's Clean Air Scientific Advisory Committee (CASAC) Joint Lead Group meeting of April 27-28, 1989, the data base for neurological effects on children is vastly more extensive than that for lead carcinogenicity. Thus, even if quantification of carcinogenic potency for lead indicates comparable exposure levels of concern, neurological endpoints are likely to remain the primary focus of concern at sites where children may be exposed to lead contaminated soils.

2 EPA's application of CDC's soil lead values for use as cleanup levels is both technically deficient and extends the use of these values well beyond the uses intended by CDC.

As noted above, EPA does not provide documentation of the scientific rationale for the soil cleanup levels announced in its September 7, 1989 directive, but instead claims that the guidance adopts a "recommendation" generated by the CDC. The section quoted by

The absence of supporting information in EPA's guidance reflects the limited basis for derivation by CDC of the soil levels cited by EPA. As described in more detail in Comment 2 below, EPA's use of CDC's values is technically inappropriate as the soil levels were not necessarily associated with any adverse health impacts, but were merely described as being levels which appeared to elevate children's blood lead levels "above background." Other technical factors limiting the applicability of CDC's values for CERCLA use are decreases in children's blood lead levels since the time of CDC's assessment, and differences in the types of sites reviewed by CDC (largely urban conditions including lead paint exposures) compared with those for which the cleanup levels are intended (CERCLA hazardous waste sites, including mining sites). It should also be noted that there is no indication CDC ever intended these soil values to serve as cleanup guides (CDC, 1985).

EPA attempts to provide some justification for its wholesale adoption of CDC's values by stating that the use of this range is only an interim measure. Additional guidance is to be provided by the Agency after it has finalized its reviews of development of a Cancer Potency Factor (CPF) or a Reference Dose (RfD) for lead. While recently evolving data on the health impacts of lead certainly merit systematic review by EPA (e.g., toxicity factor development processes), the failure to have completed these reviews does not justify proposal of soil cleanup levels which neither have a well-documented technical support nor acknowledge the substantial technically-based guidance alternatives which are currently available. These include use of the IU/BK model together with exposure and site-specific

to be protected by these cleanup levels, e.g., young children with elevated soil ingestion rates or fetuses who may be more susceptible to the neurological effects associated with lead exposures. EPA also does not relate the soil cleanup levels to blood lead levels or adverse health impacts of concern, i.e., the adverse health impacts which would be avoided or mitigated by adhering to these cleanup levels are not specified. Information on the level of protection, e.g., the fraction of the exposed population which would not experience a particular adverse health impact or which would not exceed a certain blood lead level of concern, also is not provided in the directive.

The failure to present such information raises questions regarding the scientific validity of the selected soil concentration range. In addition, vagueness regarding the derivation procedures for the cleanup values presents difficulties for selecting specific site cleanup levels either within or outside the range. For example, the Agency acknowledges that "[s]ite-specific conditions may warrant the use of soil cleanup levels" which are not within the stated range. However, without any guidance as to the factors incorporated into the initial selection of the stated range, it is unclear how selection of a value within the range or modification of these cleanup levels could be undertaken. As discussed in Comment 3 below, site-specific considerations are likely to be significant enough to negate the usefulness of generic cleanup levels in favor of site-specific measures for all sites.

dismisses substantial available information on lead toxicity, exposure, and risk. In particular, EPA fails to acknowledge significant differences in exposure mechanisms between fetuses (the primary population of concern for low-level lead exposures -- whose exposure is determined by maternal exposures) and young children (who have the most significant exposures to soil/dust lead due to enhanced soil/dust ingestion rates). The Agency also improperly rejects the use of the Integrated Uptake/Biokinetic (IU/BK) model, which provides important insights into the relationships between environmental concentrations of lead and blood lead levels. While EPA acknowledges the importance of consideration of relative bioavailability of different forms and particle sizes of lead, these data are not incorporated into the current cleanup guidance.

These comments as well as the appropriate incorporation of the IU/BK model and other generic and site-specific data into development of cleanup levels for lead are discussed in more detail below.

1 Numerous methodological and technical deficiencies exist in EPA's documentation of its interim soil cleanup levels for lead in soil.

One of the most significant problems with EPA's proposed interim soil lead cleanup guidelines is its failure to provide either the rationale or bases for selection of the 500-1,000 ppm range as the range of concern. The Agency does not identify the population

Instead, EPA states that it is adopting a "recommendation" of the Centers for Disease Control (CDC). The EPA directive provides no discussion of the target blood lead levels which would be expected following exposures to the soil cleanup levels, of the population of primary concern, or of the fraction of the population that would be protected by use of these guidelines.

EPA's inadequate technical basis is likely to reflect the limited technical justification provided by CDC in its derivation of this range (U.S. DHHS, 1985). As presented in both the EPA directive and the original CDC document to which the directive refers, the 500-1,000 ppm range is one which "appears to be responsible for blood lead levels in children increasing above background levels." Neither CDC nor EPA discuss critical factors for application of this soil lead range to site cleanup. Factors which should be considered include the magnitude of expected increase above background blood lead, the background blood lead level assumed, the nature and severity of health effects (if any) associated with such increases, or the individual and population significance of these health effects. Factors which influence the bioavailability of lead at specific sites, such as impacts of soil or other matrix composition (e.g., mining wastes), on lead uptake must also be considered. These concerns are presented in more detail in Comments 2 and 3 below.

In addition to providing insufficient technical justification for the values it has selected, the Agency's approach to setting these interim guidance levels ignores or inappropriately

ATTACHMENT TO LETTER TO JONATHAN Z. CANNON
DATED OCTOBER 26, 1989

Comments on "Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites" (U.S. EPA, September 7, 1989)

Introduction

On September 7, 1989, the Offices of Emergency and Remedial Response and of Waste Programs Enforcement of the U.S. Environmental Protection Agency (EPA) issued a directive setting interim soil cleanup levels for lead at Superfund sites (Longest and Diamond, 1989). The stated range of soil lead concentrations (500 to 1,000 ppm) is considered by these Offices to be "protective for direct contact at residential settings." The directive further states that additional soil cleanup guidance will be developed after the development of standard toxicity factors for lead (i.e., a Cancer Potency Factor and/or a Reference Dose for non-cancer health effects.)

The Agency's establishment of this cleanup range, as presented in the September 7 directive, suffers from numerous methodological and technical deficiencies. From a methodological perspective, the Agency provides little basis for selection of this range.

bpc: P. D. Bergstrom
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R. L. Dent
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T. Vernon/Colorado Department of Health
J. F. Wardell/EPA
R. L. Duprey/EPA

If EPA uses the guidance document as it appears it was intended, the above inadequacies could be at least partially remedied by site-specific studies, as in an RI/FS leading to a remedial action. However, Region VIII intends to use the guidance as if it were a regulation, applying lead cleanup levels without site-specific study.

ARCO understands EPA's need to set cleanup standards and to move forward with Superfund cleanups as expeditiously as possible. Yet, the basis of a soil cleanup level for lead must be scientifically valid. Absent such validation, we urge EPA to hold off on actions proposed to be conducted without regard to establishing a scientific basis. Shortly, we will be sending you a proposed methodology for deriving site specific soil lead cleanup levels. Our methodology will include such factors as identification of the exposed population, determining background blood lead concentrations, blood lead levels contributed from soil, health criteria, fraction of the population to be protected and bioavailability. We would appreciate the opportunity to meet with you to discuss our methodology when it is completed.

We look forward to hearing from you at your earliest convenience regarding the attachment and anticipate further discussion on soil lead cleanup methodology.

Sincerely,

Richard Krablin, Ph.D.
Manager
Environmental Projects

Attachment

pc: J. L. Scherer/U.S. EPA
W. K. Reilly/U.S. EPA
H. L. Longest II/U.S. EPA
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Richard Kraplin, Ph.D.
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October 26, 1989

Mr. Jonathan Z. Cannon
Acting Assistant Administrator
Office of Solid Waste and Emergency Response
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Dear Mr. Cannon:

ARCO Coal Company, a division of Atlantic Richfield Company, submits the attached comments on EPA's "Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites" (OSWER Directive #9355.4-02), dated September 7, 1989. The Directive sets a cleanup level of 500-1,000 ppm for total lead which the EPA considers protective for direct contact in residential settings.

EPA states that it is adopting a recommendation ("...lead in soil and dust appears to be responsible for blood levels in children increasing above background levels when the concentration in the soil and dust exceeds 500 to 1000 ppm") contained in the 1985 Centers for Disease Control (CDC) document "Preventing Lead Poisoning in Young Children." Review of this document and personal communication with CDC staff indicate that CDC never intended the 500 to 1000 ppm statement to be considered a "recommendation" and adopted as a soil cleanup level. There is no scientific documentation in the CDC document or the EPA Directive to support the interim cleanup level.

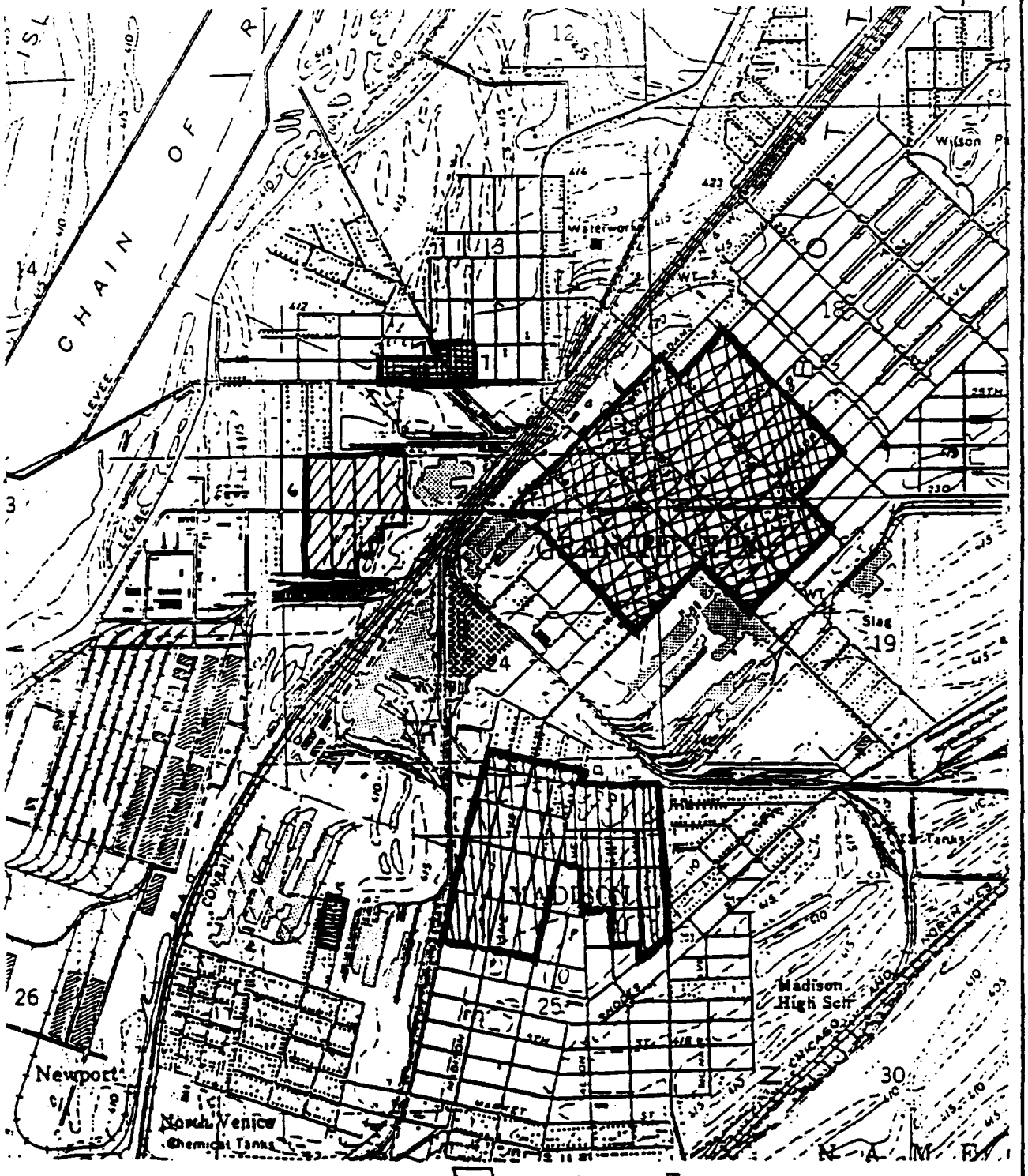
Scientific justification must be provided by EPA in order to assure that any soil lead cleanup level is adequate to protect health. The Directive improperly rejects use of the EPA Integrated Uptake Biokinetic Model which has been demonstrated to be a reliable analytical method to determine the relationship between environmental lead concentrations and blood lead concentrations in EPA lead rulemaking. In addition, the Directive has not considered background blood lead levels, target blood lead levels after cleanup, population of primary concern, fraction of the population to be protected, nature and severity of health effects and factors which influence the bioavailability of lead.

EXHIBIT B

Figure 5

GRANITE CITY SITE
GRANITE CITY, ILLINOIS

Areas 4, 5, 6, 7 and 8



- PROJECT SITE
- Area 4
- Area 5
- Area 6
- Area 7
- Area 8

NOTE: MAP ADAPTED FROM U.S.G.S. GRANITE CITY QUADRANGLE

ILLINOIS

QUADRANGLE LOCATION

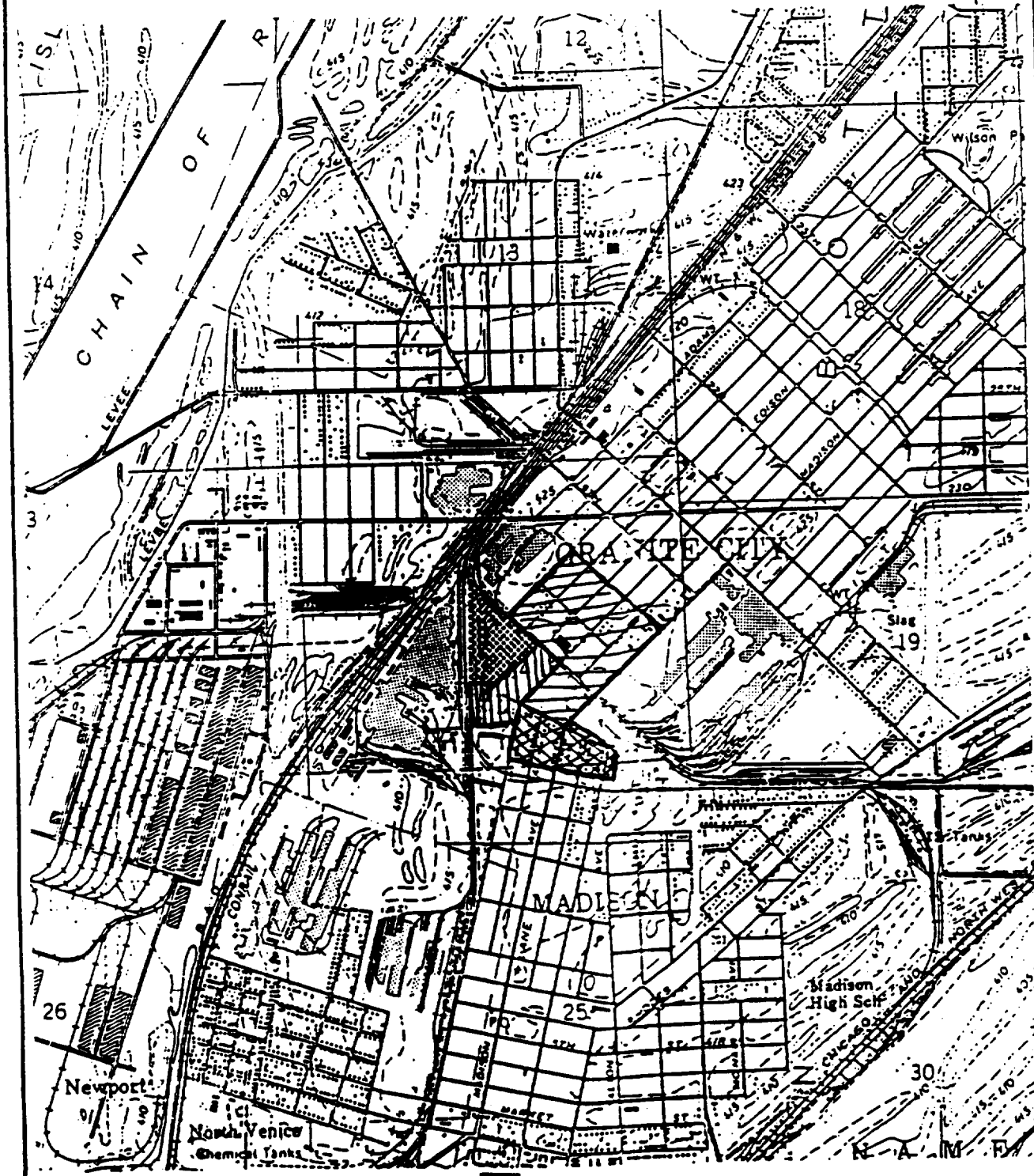
SCALE

MILES

Figure 5

NL INDUSTRIES
GRANITE CITY SITE
GRANITE CITY, ILLINOIS

Areas 1, 2, and 3



■ - PROJECT SITE ▨ - Area 2

▥ - Area 1 ▩ - Area 3

NOTE: MAP ADAPTED FROM U.S.G.S. GRANITE CITY QUADRANGLE

ILLINOIS

QUADRANGLE LOCATION

SCALE

0 1

MILES

TABLE 1

Results - Granite City 1982 IDPH
Blood Lead Survey

Areas[1]	Number[2]	FEP[3]	P6B[4]	Potential[5] Health Risk
2	6	16.8 (9-45)	17.1 (10-24)	0
3	2	16.1 (13-20)	33.5 (30-37)	0
4	6	19.5 (8-76)	15.8 (8-41)	2 [6]
5	1	1	10	0
6	3	17.8 (13-31)	11.9 (11-14)	0
7	2	28.8 (17-49)	8.4 (5-14)	0
8N	13	13.8 (6-24)	8.0 (3-32)	0
Total Granite City	13	14.1 (1-49)	10.4 (3-41)	0

1 Areas correspond to areas proposed by EPA for remediation in Figures 4-5.

2 Number of children age 1 to 6 years.

3 FEP - Geometric Mean (range), Free Evythrocyte (mg/dl).

4 P6B - Geometric Mean (range), Blood Lead (mg/dl).

5 CDC action level of both FEP>35 mg/dl and P6B>15.

6 Area 4 levels are believed to be from a source other than soil lead.

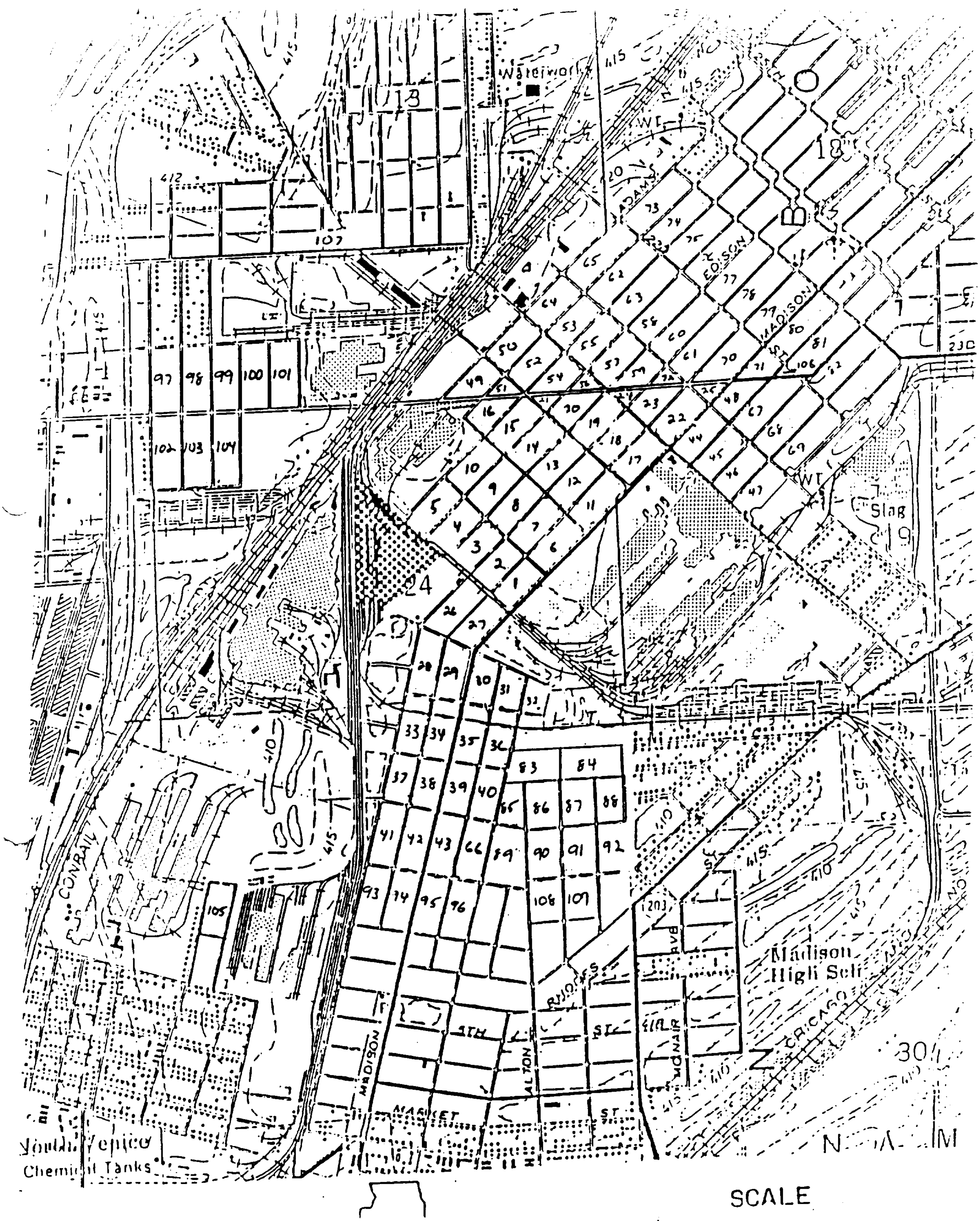
City	Street	Sex	Age	FEP	BL
Granite City	2904 Harding	M	43	18	26
Granite City	2904 Harding	F	2	-	-
Granite City	2021 Dewey	M	2	18	22
Granite City	2021 Dewey	F	22	16	5
Granite City	2322 Delmar	F	3	12	14
Granite City	2322 Delmar	F	4	18	13
Granite City	2322 Delmar	F	32	19	15
Granite City	1619 Edison	F	6	18	24
Granite City	1619 Edison	F	30	20	15
Granite City	2159 Benton	M	4	6	10
Granite City	2159 Benton	F	-	13	11
Granite City	1442 Grand	F	4	13	30
Granite City	1442 Grand	P	30	15	7
Granite City	1443 Grand	F	38	10	9
Granite City	1443 Grand	M	4	20	37
Granite City	1103 Madison	M	1	8	11
Granite City	1103 Madison	F	27	10	3
Madison	1021 Grand (Apt)	F	3	76	28
Madison	1021 Grand (Apt)	M	4	30	27
Madison	1021 Grand (Apt)	P	13	11	8
Madison	1021 Grand (Apt)	P	25	12	12
Madison	1207 Market	M	1	59	5
Madison	1207 Market	F	3	16	9
Madison	1207 Market	P	27	24	5
Madison	1109 Bissell	F(?)	1 ½	18	6
Madison	1109 Bissell	F	35	53	5
Madison	1109 Bissell	M	38	32	11
Madison	202 Logan	M	60	11	8
Madison	202 Logan	M	5	18	9
Madison	1034 Logan	F	5	16	14
Madison	1034 Logan	M	24	18	16
Madison	1034 Logan	M	54	19	22
Madison	1217 Market (rear)	P	24	25	2
Madison	1217 Market (rear)	F	5	23	8
Madison	713 Jackson	M	3	14	13
Madison	713 Jackson	F	29	15	3
Madison	213 Bissell	M	1	6	10
Madison	213 Bissell	F	18	11	16
Madison	403 W 3rd	F(?)	1	5	18
Madison	403 W 3rd	F	26	6	8
Madison	615 Meredocia	M	56	1	4
Madison	615 Meredocia	M	6	1	10
Madison	201 Weaver (Apt)	F	2	63	22
Madison	201 Weaver (Apt)	F	32	1	8
Madison	914 Grand	F	3	11	12
Madison	914 Grand	F	35	9	7
Madison	925 Iowa	F	26	7	-
Madison	925 Iowa	M	23	3	-
Madison	857 Alton	F	25	21	6
Madison	857 Alton	M	1	-	1
Madison	405 W 3rd	F	21	4	10
Madison	405 W 3rd	F	3	3	11

3376J

EXHIBIT B

City	Street	Sex	Age	FEP	BL
Granite City	2026 Cleveland	M	5	9	-
Granite City	2026 Cleveland	F	29	13	10
Granite City	900 Alton	F	2	21	5
Granite City	900 Alton	P	22	13	2
Granite City	1401 Iowa	P	5	13	8
Granite City	1401 Iowa	M	40	12	9
Granite City	1401 Iowa	F	33	20	6
Granite City	1710 Cleveland	M	2	16	23
Granite City	1710 Cleveland	M	4	15	21
Granite City	1710 Cleveland	F	27	43	28
Granite City	3025 Buxton	F	1	1	6
Granite City	3025 Buxton	F	30	2	10
Granite City	3156 Jill	M	1	13	5
Granite City	3156 Jill	P	20	21	10
Granite City	2406 A State (Apt?)	M	6	24	8
Granite City	2406 A State (Apt?)	M	32	21	7
Granite City	1737 Olive	M	5	14	14
Granite City	1737 Olive	F	31	17	9
Granite City	2341 Benton	M	5	24	20
Granite City	2341 Benton	P	30	21	12
Granite City	2502 State	M	5	18	8
Granite City	2502 State	P	26	28	8
Granite City	2919 Denver	M	39	17	21
Granite City	2919 Denver	M	2	49	5
Granite City	2132A Adams (Apt?)	M	4	9	3
Granite City	2132A Adams (Apt?)	F	1	10	5
Granite City	2132A Adams (Apt?)	F	Adult	10	5
Granite City	2132A Adams (Apt?)	M	30	9	10
Granite City	2443 State	F	30	30	5
Granite City	2443 State	F	1	21	5
Granite City	2436 Adams	M	4	8	6
Granite City	2436 Adams	F	27	22	8
Granite City	2641 Benton	M	3	18	6
Granite City	2691 Benton	P	34	19	6
Granite City	1742 Popular	P	2	31	11
Granite City	1742 Popular	M	5	13	11
Granite City	1739 Edison	P	4	13	10
Granite City	1739 Edison	P	3	45	15
Granite City	1739 Edison	F	20	13	2
Granite City	2618 Denver	F	5	12	14
Granite City	2618 Denver	P	25	19	8
Granite City	1634 Cleveland	F	5	9	14
Granite City	1634 Cleveland	F	23	10	11
Granite City	2145 Cleveland	M	3	19	19
Granite City	2145 Cleveland	F	23	18	-
Granite City	2152 State	M	4	11	32
Granite City	2152 State	F	24	11	11
Granite City	2158 State	M	4	10	4
Granite City	2158 State	F	29	21	10

EXHIBIT C


CONRAIL
ADAMS
EDISON
MADISON ST
Slag
MADISON
ALTON
MARKET ST
CHICAGO
SCALE

ALTERNATIVE H WORKSHEET

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AREA 2			AREA 3			AREA 4			AREA 5			AREA 6			AREA 7			AREA 8S			AREA 8M		
Block	SF	CY	Block	SF	CY	Block	SF	CY	Block	SF	CY	Block	SF	CY	Block	SF	CY	Block	SF	CY	Block	SF	CY
1.0	0.0	0.0	28.0	107000.0	1981.6	33.0	54000.0	1000.0	105.0	108000.0	2000.0	98.0	144000.0	2666.7	107.0	168000.0	3111.1	11.0	0.0	0.0	49.0	0.0	0.0
2.0	0.0	0.0	29.0	114300.0	2116.8	34.0	72000.0	1333.3	T	108000.0	2000.0	99.0	144000.0	2666.7	T	168000.0	3111.1	12.0	0.0	0.0	50.0	90000.0	1666.7
3.0	36000.0	666.7	30.0	136200.0	2522.4	35.0	54000.0	1000.0	A	2.5	1000.0	100.0	144000.0	2666.7	A	3.9	1555.6	13.0	0.0	0.0	51.0	0.0	0.0
4.0	54000.0	1000.0	31.0	86400.0	1600.1	36.0	90000.0	1666.7	ST	12900.0		101.0	144000.0	2666.7	ST	10666.7		14.0	0.0	0.0	52.0	90000.0	1666.7
5.0	54000.0	1000.0	32.0	25200.0	466.7	37.0	108000.0	2000.0	PV	4000.0		103.0	144000.0	2666.7	PV	6222.2		15.0	0.0	0.0	53.0	90000.0	1666.7
6.0	18000.0	333.3	T	469100.0	8687.7	38.0	108000.0	2000.0	SB	8000.0		104.0	144000.0	2666.7	SB	12444.4		16.0	0.0	0.0	54.0	42600.0	788.9
7.0	18000.0	333.3	A	10.8		39.0	108000.0	2000.0				T	864000.0	16000.0				17.0	0.0	0.0	55.0	108000.0	2000.0
8.0	108000.0	2000.0	ST	52122.2		40.0	108000.0	2000.0				A	19.8	8000.0				18.0	0.0	0.0	56.0	33600.0	622.2
9.0	108000.0	2000.0	PV	17374.1		41.0	108000.0	2000.0				ST	96000.0					19.0	0.0	0.0	57.0	0.0	0.0
10.0	108000.0	2000.0	SB	34748.1		42.0	108000.0	2000.0				PV	32000.0					20.0	0.0	0.0	58.0	135000.0	2500.0
26.0	0.0	0.0				43.0	72000.0	1333.3				SB	64000.0					21.0	0.0	0.0	59.0	0.0	0.0
27.0	0.0	0.0				66.0	108000.0	2000.0										22.0	54000.0	1000.0	60.0	135000.0	2500.0
T	504000.0	9333.3				83.0	90000.0	1666.7										23.0	7100.0	131.5	61.0	162000.0	3000.0
A	11.6	4666.7				84.0	135000.0	2500.0										24.0	0.0	0.0	62.0	135000.0	2500.0
ST	56000.0					85.0	0.0	0.0										25.0	33600.0	622.2	63.0	135000.0	2500.0
PV	18666.7					86.0	105000.0	1944.4										44.0	0.0	0.0	64.0	54000.0	1000.0
SB	37333.3					87.0	105000.0	1944.4										45.0	54000.0	1000.0	65.0	135000.0	2500.0
						88.0	105000.0	1944.4										46.0	108000.0	2000.0	70.0	66600.0	1233.3
						89.0	0.0	0.0										48.0	0.0	0.0	71.0	0.0	0.0
						90.0	115200.0	2133.3										67.0	0.0	0.0	72.0	0.0	0.0
						91.0	115200.0	2133.3										68.0	81000.0	1500.0	73.0	0.0	0.0
						92.0	115200.0	2133.3										T	337700.0	6253.7	74.0	162000.0	3000.0
						93.0	108000.0	2000.0										A	7.8	3186.9	75.0	162000.0	3000.0
						94.0	108000.0	2000.0										ST	37522.2		76.0	162000.0	3000.0
						95.0	108000.0	2000.0										PV	12507.4		77.0	162000.0	3000.0
						96.0	108000.0	2000.0										SB	25014.8		78.0	162000.0	3000.0
						108.0	115200.0	2133.3													79.0	162000.0	3000.0
						109.0	115200.0	2133.3													80.0	135000.0	2500.0
						T	2646000.0	49000.0													81.0	0.0	0.0
						A	60.7	24500.0													106.0	0.0	0.0
						ST	294000.0														T	2518800.0	46644.4
						SB	196000.0														A	57.8	23322.2
						PV	98000.0														ST	279866.7	
																					PV	93288.9	
																					SB	186577.8	

EXHIBIT D